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OPNAV-16-VT#301

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5899-1

# JAPANESE AIRCRAFT

PERFORMANCE & CHARACTERISTICS

TAIC MANUAL NO 1



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MEMORANDUM

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OFFICE OF THE CHIEF OF NAVAL OPERATIONS

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WARD CHENEY  
Commander, USNR

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11 JUL 1945

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\*Obsolete or obsolescent. \*\*Performance not available. \*\*\*Performance will be issued.

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\*Obsolete or obsolescent. \*\*Performance not available. \*\*\*Performance will be issued June 1945.

June 1945

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## INTRODUCTION

### GENERAL

Japanese Aircraft Performance and Characteristics TAIC Manual No. 1 is now issued in the Division of Naval Intelligence by combined personnel of the United States and British Services attached to the Technical Air Intelligence Center, Naval Air Station, Anacostia, D. C. TAIC Manual No. 1 is the Official Japanese Aircraft P & C Manual for the Allied Forces and is issued to provide up-to-date Performance and Characteristics data in a standardized, convenient, and useful form.

Data sheets will be revised as more complete and accurate data becomes available. It is essential, therefore that revised sheets be entered in the Manual immediately upon receipt and that the supplement number of the revised sheets be entered in the space provided on the inside front cover.

All sheets pertaining to the same basic type of aircraft, such as the Zeke types, carry the same basic number followed by a different capital letter for each particular model, starting with "A" for the first model. The capital letter is followed by a number to indicate page number for the set of sheets covering a particular airplane. For example the data on Zeke 32 will be found on sheets 102 C-1, 102 C-2, etc., while the data on Zeke 52 will be found on sheets 102 D-1, 102 D-2, etc.

An index is provided for convenience in locating data on fighters, bombers, etc., and for locating data on engines, armament, radio, etc. The alphabetical index will assist in rapidly locating data on a given aircraft.

### PERFORMANCE CALCULATIONS

Except where otherwise stated, performance figures represent estimates of the Technical Air Intelligence Center and have been calculated after a careful analysis of information derived from intelligence, captured equipment, drawings, and photographs, using power ratings derived from the same sources. When authoritative evidence is not available, it is the policy of TAIC to give the Japanese Aircraft Performance every benefit of the doubt within reasonable limits.

Aircraft weights are estimated except where noted. In general the weights have been set up to show the maximum military effort for several representative conditions.

Range is computed in straight and level flight at 1,500 feet altitude. Bombing plane range figures include dropping of bombs at approximately mid-distance or range.

All speeds are expressed as true airspeed at the altitude concerned and are based on the airplane having a smooth finish and most favorable drag. Vmax is estimated using Military Power (Mil. H. P.) and, when available, War Emergency Power (WEP) for representative conditions.

Horsepowers are expressed in English units.

Wing areas are gross areas including fuselage areas intercepted by wings.

Rates of climb are based on Military Power for continuous climbing and War Emergency Power (when available) for short duration get-a-way climbs.

Times to altitude are based on Military Power *only*.

### RANGE—SPEED—CLIMB CURVES

These curves are furnished for convenience in determining the range, speed, and climb of a given airplane under various representative conditions.

### FIELDS OF FIRE—VULNERABILITY—FLAME PATTERNS

These data are presented so that important combat data required in planning will be available on one sheet. "Fields of Attack" or "Fire Free Fields" are included for certain aircraft to assist in visualizing best angles of approach. "Flame Patterns," where shown, are rear views.

### DRAWINGS AND PHOTOS

Graphic data are included wherever possible so as to provide a visual conception of each aircraft.

### ENGINES—ARMAMENT—RADIO

See introduction to each particular section.

### REMARKS

Reliable data which definitely indicates that any of the material presented in TAIC Manual No. 1 is inaccurate should be immediately forwarded to the Technical Air Intelligence Center, Naval Air Station, Anacostia, D. C.

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## JAPANESE CODE NAMES

The purpose of this section is to clarify the chronological development of coded Japanese aircraft and to give data on earlier models whose performance is not included in the Manual. In some cases where the latest model of a series is believed to be in limited production, full data is given on any preceding model that is fully operational. Obsolete or obsolescent aircraft are indicated as such under the heading "Comments."

Engines are listed by their operational designations where possible and by the latest abbreviated "Ha" symbols in cases where no other information is available.

Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				
NAVY FIGHTERS								
CLAUDE 14	Claude	1E-F	Type 96 carrier-borne fighter, Model 14	A5M4	Mitsubishi	Korobuki 41, 9 cyl. radial	Nakajima	Obsolete, but reported in operations recently. May have Korobuki 42 engine.
ZEKE 11	Zeke Mk 1	1E-F	Type 0 carrier-borne fighter, Model 11	A6M1	Mitsubishi	Sakae 12, 14 cyl. radial	Nakajima	Obsolete. Fixed wing tips.
ZEKE 21	Zeke Mk 1	1E-F	Type 0 carrier-borne fighter, Model 21	A6M2	Mitsubishi and Nakajima	Sakae 12, 14 cyl. radial	Nakajima	Going out of service. Folding wing tips. 142 U. S. gals. fuel.
ZEKE 22	Zeke Mk 2	1E-F	Type 0 carrier-borne fighter, Model 22	A6M3 Modified	Mitsubishi	Sakae 21, 14 cyl. radial	Nakajima and Ishikawajima	Out of production. Folding wing tips. 156 U. S. gals. fuel. Auxiliary tanks within wings.
ZEKE 32	Hamp	1E-F	Type 0 carrier-borne fighter, Model 32	A6M3	Mitsubishi	Sakae 21, 14 cyl. radial	Nakajima and Ishikawajima	Out of production. Blunt wing tips. Shorter span. 137 U. S. gals. fuel.
ZEKE 52	.....	1E-F	Type 0 carrier-borne fighter, Model 52	A6M5	Mitsubishi	Sakae 21, 14 cyl. radial	Nakajima	Blunt, rounded wing tips. 156 U. S. gals. fuel. Same span as ZEKE 32.
ZEKE 52	.....	1E-F	Ditto	A6N5	Nakajima	Sakae 31, 14 cyl. radial	Nakajima	Latest development of ZEKE series. Model designation may be temporary.
RUFE 11	Rufe	1E-FFP	Type 2 fighter seaplane, Model 11	A6M2-N	Nakajima	Sakae 12, 14 cyl. radial	Nakajima	Obsolescent. Developed from ZEKE 21.
SAM 11	.....	1E-F	"Reppu" 17 Experimental carrier-borne fighter	A7M1	Mitsubishi	Homare 41, 18 cyl. radial	Nakajima	Expected in late 1944.
IRVING 11	.....	2E-F	"Gekko" night fighter, Model 11 (13 Experimental 2-engine land fighter)	J1N1-S	Nakajima	Sakae 21, 14 cyl. radial	Nakajima	See also "Navy Reconnaissance." In use as night fighter. Originally listed with Sakae 21 and 22 (22 reduction gear affects opposite prop. rotation).
IRVING 12	.....	2E-F	"Gekko" night fighter, Model 12	.....	.....	.....	.....	.....

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

## NAVY FIGHTERS—Continued

JACK 11	.....	1E-F	"Raiden" fighter, Model 11 (14 Experimental interceptor fighter, modified)	J2M2	Mitsubishi	Kasei 23, 14 cyl. radial	Mitsubishi	J2M1 was the experimental version, and J2M2 is now in production with 4-blade prop. and heavier armament.
JACK 12	.....	1E-F	Ditto Model 12	J2M3	Mitsubishi	.....	.....	.....
GEORGE 11	.....	1E-F	"Shiden" fighter (15 Experimental interceptor fighter)	N1K2-J	Kawanishi	Homare 21, 18 cyl. radial	Nakajima	In production. N1K1-J was the experimental version. N1K2-J has modified fuselage and additional armament.
REX 11	.....	1E-FFP	"Kyofu" fighter seaplane, Model 11 (15 Experimental fighter seaplane)	N1K1	Kawanishi	Kasei 24, 14 cyl. radial	Mitsubishi	In production. Possible replacement for RUFE. Contra rotating props.
LUKE 11	.....	F	"Jinrai" 17 Experimental interceptor fighter	J4M1	Mitsubishi	Ha 43, Model 41	.....	Twin boom, reported to have 2 x 20 mm. and 2 x 30 mm. guns.

## NAVY RECONNAISSANCE

BABS 11	Babs	1E-R	Type 98 land recce plane, Model 11	C5M1	Mitsubishi	Zuisei 12, 14 cyl. radial	Mitsubishi	Obsolete. BABS was used by both JAAF and JNAF. One of 2 planes known to be used by both services, the Army's DINAH, being the other.
BABS 12	Babs	1E-R	Type 98 land recce plane, Model 12	C5M2	Mitsubishi	Sakae 12, 14 cyl. radial	Nakajima	Obsolete. May have Sakae 21 (Ha 35 Model 21).
JUDY 11	Judy	1E-R	Type 2 carrier-borne recce plane, Model 11 (13 Experimental carrier bomber)	D4Y1-C	Aichi	Atsuta 21, 12 cyl. inline	Aichi	See also "Navy Dive Bombers." Suisei Model 11 converted to recce.
JUDY 12	Judy	1E-R	Type 2 carrier-borne recce plane, Model 12	D4Y2-R	.....	Atsuta 31, 12 cyl. inline	Aichi	Converted to use 2-K8 cameras.
MYRT 11	.....	1E-R	"Saiun" carrier-borne recce plane, Model 11 (17 Experimental carrier-borne recce)	C6N1	Nakajima	Homare 21, 18 cyl. radial	Nakajima	Fastest Navy recce plane.

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

## NAVY RECONNAISSANCE—Continued

SLIM 11	Slim	1E-RFP	Type 96 small recce seaplane, Model 11	E9W1 or E9N1	Watanabe or Nakajima	Amakaze 12, 9 cyl. radial	Tokyo Gasu Denki	Obsolete. Used as submarine-borne recce.
JAKE 11	Jake	1E-RFP	Type 0 recce seaplane, Model 11 (12 Experimental 3-seater recce seaplane)	E13A1	Watanabe	Kinsei 43 or 44, 14 cyl. radial	Mitsubishi 43; Hiro and Mitsubishi 44	Newer planes mount 20 mm. gun.
GLEN 11	Glen	1E-RFP	Type 0 small seaplane, Model 11	E14Y1	Yokosuka?	Amakaze 11, 9 cyl. radial	Tokyo Gasu Denki	One source gives "Watanabe" as the maker. Used as submarine-borne recce.
NORM 11	.....	1E-RFP	"Shiun" high-speed recce seaplane, Model 11 (14 Experimental high-speed recce seaplane)	E15K1	Kawanishi?	Kasei 24, 14 cyl. radial	Mitsubishi	Scheduled for production at end of 1943. May be "15 Experimental." Contra rotating props.
PAUL 11	.....	1E-2S-RFP	"Zuiun" 2-seater recce seaplane, Model 11 (14 Experimental recce seaplane 2-seater)	E16A1	Aichi	Kinsei 54, 14 cyl. radial	Mitsubishi	Kinsei 54 has MG synchronizer. Used as dive bomber. In production. Exp. version had Kinsei 51 engine.
PETE 11	Pete	1E-OFP	Type 0 observation plane, Model 11	F1M2	Sasebo and Mitsubishi	Zuisei 13, 14 cyl. radial	Mitsubishi	F1M1 and F1A1 were the experimental versions.
IRVING 11	.....	2E-R	Type 2 land-recce plane, Model 11 (13 Experimental land fighter)	J1N1	Nakajima	Sakae 21, 14 cyl. radial	Nakajima	See also "Navy fighters."

## NAVY TORPEDO PLANES

KATE 11	Kate Mk 1	1E-TB	Type 97 carrier-borne attack plane, Model 11	B5N1	Nakajima	Hikari 3, 9 cyl. radial	Nakajima	Obsolete.
KATE 61	Kate Mk 2	1E-TB	Type 97 carrier-borne attack plane, Model 61	B5M1	Mitsubishi?	Kinsei 43, 14 cyl. radial	Mitsubishi	Obsolete. Also listed as "B5N1 modified."
KATE 12	Kate Mk 3	1E-TB	Type 97 carrier-borne attack plane, Model 12	B5N2	Hiro, Aichi and Nakajima	Sakae 11, 14 cyl. radial	Nakajima	Obsolescent. Being replaced by JILL.

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

## NAVY TORPEDO PLANES—Continued

JILL 11	Jill	1E-TB	"Tenzan" carrier-borne attack plane, Model 11 (14 Experimental carrier-borne attack plane)	B6N1	Nakajima	Mamoru 11, 14 cyl. radial	Nakajima	First version of JILL. Still being produced but less than B6N2.
JILL 12	Jill	1E-TB	"Tenzan" carrier-borne attack plane, Model 12	B6N2	Nakajima	Kasei 25, 14 cyl. radial	Mitsubishi	Principal torpedo plane now in production.
GRACE 11		1E-TB	"Ryusei" 16 Experimental carrier-borne attack plane	B7A1	Aichi	Homare 11, 18 cyl. radial	Nakajima	Possible replacement of Aichi's KATE. May also be used, as dive bomber.

## NAVY DIVE BOMBERS

VAL 11	Val Mk 1	1E-TB	Type 99 carrier-borne bomber, Model 11	D3A1	Aichi	Kinsei 44, 14 cyl. radial	Mitsubishi and Hiro	Obsolete.
VAL 22	Val Mk 2	1E-DB	Type 99 carrier-borne bomber, Model 22	D3A2	Aichi	Kinsei 54, 14 cyl. radial	Mitsubishi	Still operational. Being converted to trainer.
JUDY 11	Judy	1E-DB	"Suisei" carrier-borne bomber, Model 11 (13 Experimental carrier-borne bomber)	D4Y1	Aichi	Atsuta 21, 12 cyl. inline	Aichi	See also "Navy Reconnaissance."
JUDY 12		1E-DB	"Suisei" carrier-borne bomber, Model 12	D4Y2	Aichi	Atsuta 31, 12 cyl. inline	Aichi	In service.
JUDY 22		1E-DB	"Suisei" carrier-borne bomber, Model 22			Atsuta 31, 12 cyl. inline	Aichi	
JUDY 21		1E-DB	"Suisei" carrier-borne bomber, Model 21		Aichi?	Atsuta 21, 12 cyl. inline	Aichi	Described as "Suisei Model 11, converted for catapult use."

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				
NAVY BOMBERS								
NELL 11	Nell Mk 1	2E-B	Type 96 land attack plane, Model 11	G3M1	Mitsubishi	Kinsei 41, 42 or 45, 14 cyl. radial	Mitsubishi	Obsolete. See also "Navy Transports."
NELL 21	Nell Mk 1	2E-B	Type 96 land attack plane, Model 21	G3M2	Mitsubishi	Kinsei 41, 42 or 45, 14 cyl. radial	Mitsubishi	Obsolete. Mounted 20 mm. top gun aft.
NELL 23	Nell Mk 3	2E-B	Type 96 land attack plane, Model 23	G3M3	Nakajima	Kinsei 51, 52 or 53, 14 cyl. radial	Mitsubishi	Obsolescent. NELL is now used mainly for training and transport. Also listed as "G3M2 modified."
BETTY 11	Betty Mk 1	2E-B	Type 1 land attack plane, Model 11	G4M1	Mitsubishi	Kasei 11 or 15, 14 cyl. radial	Mitsubishi and Hiro	See also "Navy Transports." When used as a transport, model-type symbol is not given.
BETTY 22	Betty Mk 2	2E-B	Type 1 land attack plane, Model 22	G4M2	Mitsubishi	Kasei 21, 14 cyl. radial	Mitsubishi	Formerly called "Model 12." In production. Overload weight 33,000 lbs.
BETTY 24	.....	2E-B	Type 1 land attack plane, Model 24	.....	Mitsubishi	Kasei 25, 14 cyl. radial	Mitsubishi	May be a temporary designation.
BETTY 25	.....	2E-B	Type 1 land attack plane, Model 25	.....	Mitsubishi	Kasei 27, 14 cyl. radial	Mitsubishi	Formerly called "Model 14." May still be a temporary designation
BETTY 34	.....	2E-B	Type 1 land attack plane, Model 34	G4M3	Mitsubishi	Kasei 25, 14 cyl. radial	Mitsubishi	Formerly called "Model 22." In production. Reported "Completely bullet proofed."
LIZ 11	Liz	4E-B	Type 2 land attack plane, Model 11 (13 Experimental land attack plane)	G5M1	Mitsubishi	Kasei 11 or Mamoru 11?, 14 cyl. radial	Mitsubishi and Nakajima	Believed unsuccessful. Redesignated by Nakajima as "G5N1."
LIZ 11	Liz	4E-B	"Shinzan" land attack plane, Model 11	G5N1	Nakajima	Mamoru 11, 14 cyl. radial	Nakajima	In production. Used as transport. Reports have referred to Kasei 21 engines also.
LIZ 12?	Liz	4E-B	Ditto Model 12	G5N2	Nakajima	Mamoru 12, 14 cyl. radial	Nakajima	Model designation is uncertain.
FRANCES 11	.....	2E-B	"Ginka" bomber (15 Experimental land-based bomber Y-20)	P1Y1	Nakajima	Homare 11, 18 cyl. radial	Nakajima	In production.
FRANCES 12?	.....	2E-	Hakko night fighter	P1Y1-S	Yokosuka Kaigun Gijutsusho	Kasei 25, 14 cyl. radial	Mitsubishi	"Ginka" converted to night fighter. The Kyokko version may be a night attack torpedo plane.

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				
NAVY TRANSPORTS								
TESS 11 (Trans)	Tess	2E-Trans	Type O transport plane, Model 11 (D-2 transport plane)	L2D2	Showa	Kinsei 43, 14 cyl. radial	Mitsubishi	Evolved from Douglas "D-C 2."
TESS 11 (Cargo)	Tess	2E-Trans	Type O cargo plane, Model 11 (D-2 cargo plane)	L2D2-L1	.....	Kinsei 43, 14 cyl. radial	Mitsubishi	Not same as TESS transport or passenger transport.
TESS 11 (Pass.)	Tess	2E-Trans	Type O passenger transport	.....	.....	Kinsei 43, 14 cyl. radial	Mitsubishi	.....
TABBY 22 (Trans)	Tess	2E-Trans	Type O transport plane, Model 22	L2D3	Showa?	Kinsei 51, 52 or 53, 14 cyl. radial	Mitsubishi	Evolved from Douglas "D-C 3"
TABBY 22 (Cargo)	Tess	2E-Trans	Type O cargo plane, Model 22	.....	.....	Kinsei 53, 14 cyl. radial	Mitsubishi	Transport version converted to cargo.
TABBY 32 (Pass.)	Tess	2E-Trans	Type O passenger transport, Model 32	.....	.....	Kinsei 53, 14 cyl. radial	Mitsubishi	.....
NELL 11 (Trans)	Nell Transport	2E-Trans	Type 96 land transport, Model 11	L3Y1	.....	Kinsei 41 or 42, 14 cyl. radial	Mitsubishi	Obsolete. See also "Navy Bombers." Also listed as "G3M1-D."
NELL 21 (Trans)	Nell Transport	2E-Trans	Type 96 land transport, Model 21	L3Y2	Mitsubishi	Kinsei 41 or 42, 14 cyl. radial	Mitsubishi	Obsolete. Also listed as "G3M2-D special transport."
NELL 22 (Trans)	Nell Transport	2E-Trans	Type 96 land transport, Model 22	.....	Mitsubishi	Kinsei 45, 14 cyl. radial	Mitsubishi	Obsolescent.
NELL 23 (Trans)	Nell Transport	2E-Trans	Type 96 land transport, Model 23	.....	Nakajima	Kinsei 52, 14 cyl. radial	Mitsubishi	Obsolescent.
BETTY 11 (Trans)	.....	2E-Trans	Type 1 land attack plane	.....	Mitsubishi	Kasei 11 or 15, 14 cyl. radial	Mitsubishi or Hiro	Bomber modified to serve as transport.

**NAVY FLYING BOATS**

MAVIS 11	Mavis	4E-FB	Type 97 flying boat, Model 11	H6K2	Kawanishi	Kinsei 43, 14 cyl. radial	Mitsubishi	Obsolete.
MAVIS 11 (Trans)	Mavis Transport	4E-FB Trans	Type 97 transport flying boat, Model 11	H6K3	Kawanishi	Kinsei 46, 14 cyl. radial	Mitsubishi	Type 97 flying boat, model 11 modified.
MAVIS 22	Mavis	4E-FB	Type 97 flying boat, Model 22	H6K4	Kawanishi	Kinsei 43 or 46, 14 cyl. radial	Mitsubishi	.....
MAVIS 23	Mavis	4E-FB	Type 97 flying boat, Model 23	H6K5	Kawanishi	Kinsei 51 or 53, 14 cyl. radial	Mitsubishi	.....

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

## NAVY FLYING BOATS—Continued

EMILY 11	Emily	4E-FB	Type 2 flying boat, Model 11	H8K1	Kawanishi	Kasei 12, 14 cyl. radial	Mitsubishi	7.7 MG in front and sides.
EMILY 12	Emily	4E-FB	Type 2 flying boat, Model 12	H8K2	Kawanishi	Kasei 22, 14 cyl. radial	Mitsubishi	Fuel tank armor increased weight by 900 kg; 20 mm. cannon replace 7.7 MG.
EMILY 22	Emily	4E-FB	Type 2 flying boat, Model 22	H8K3	Kawanishi	Kasei 22, 14 cyl. radial	Mitsubishi	Model 12 "made bullet-proof."
EMILY 32 (Trans)	Emily Transport	4E-FB Trans	"Seiku" transport flying boat, Model 32	H8K2-L	.....	Kasei 22, 14 cyl. radial	Mitsubishi	In production 1943.
CHERRY 11	Cherry	2E-FB	Type 99 medium flying boat, Model 11	H5Y1?	.....	Shinten 21, 14 cyl. radial	Nakajima	.....

## ARMY FIGHTERS

NATE 1	Mate	1E-F	Type 97 fighter	Ki 27	Nakajima	Type 97, 650 hp., 9 cyl. radial	Nakajima	Obsolete. Used as trainer.
OSCAR 1	Oscar Mk 1	1E-F	Type 1 fighter, Model 1	Ki 43	Nakajima	Type 99, 950 hp., 14 cyl. radial	Nakajima	Obsolete.
OSCAR 2	Oscar Mk 2	1E-F	Type 1 fighter, Model 2	Ki 432	Nakajima	Type 2, 1150 hp., 14 cyl. radial	Nakajima and Kawasaki	Blunt wing tips. Early models had round wing tips and longer span.
OSCAR 3	.....	.....	Type 1 fighter, Model 3	.....	.....	.....	.....	Possibly operational in late 1944.
TOJO 1	Tojo	1E-F	Type 2 fighter, Model 1	Ki 44	Nakajima	Type 100, 1250 hp., 14 cyl. radial	Nakajima	.....
TOJO 2	Tojo	1E-F	Type 2 fighter, Model 2	Ki 442	Nakajima	Type 2, 1450 hp., 14 cyl. radial	Nakajima	Now operational in all Army areas.
NICK 1	Nick	2E-F	Type 2 heavy fighter	Ki 45	Kawasaki	Type 1, 1050 hp., 14 cyl. radial	Mitsubishi	Night fighter.
TONY 1	Tony	1E-F	Type 3 fighter, Model 1	Ki 61	Kawasaki	Type 2, 1100 hp., 12 cyl. inline	Kawasaki	Engine appears to be based on DB 601 A.
ROB 1	.....	1E-F	High-speed fighter	Ki 64	Kawasaki	Ha 72, Model 11, (Ha 201) inline	.....	May replace TONY. Engine may be based on later model Daimler Benz.
STEVE 1	.....	1E-F	Type 3 super-high-speed fighter	Ki 73	.....	Ha 42, Model 11, (Ha 104) 2000 hp., 18 cyl. radial	Mitsubishi	.....
PAT 1	.....	1E-F	Super-range high-speed fighter	Ki 74	Tachikawa	Ha 221	.....	.....
FRANK 1	.....	1E-F	Single-seater fighter	Ki 84	Nakajima	Ha 45, Model 21, 2000 hp, 18 cyl. radial	Nakajima	In production.

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

## ARMY RECONNAISSANCE AND LIGHT BOMBERS

MARY 1	Mary	1E-R	Type 98 light bomber	Ki 32	Kawasaki	Type 98, 800 (or 850) hp., 12 cyl. inline	.....	Obsolete. Used as trainer.
IDA 1	Ida	1E-R	Type 98 direct-cooperation plane	Ki 36	Tachikawa?	Type 98, 450 hp., 9 cyl. radial	Probably Nakajima	Obsolescent. Used as trainer.
SONIA 1	Sonia	1E-R	Type 99 "A" recce plane	Ki 51	Rikugun Koku Kosho	Type 99, Model 2, 900 hp., 14 cyl. radial	Mitsubishi	Obsolescent.
SONIA 1	Sonia	1E-R	Type 99 "B" assault plane	Ki 51	Mitsubishi	Type 99, Model 2, 900 hp., 14 cyl. radial	Mitsubishi	Has been used for ground attack and mistaken for VAL.
DINAH 1	Dinah	2E-R	Type 100 HQ recce plane, Model 1	Ki 46	Mitsubishi	Type 99, 900 hp., 14 cyl., radial	Mitsubishi	Obsolete.
DINAH 2	Dinah Mk 2	2E-R	Type 100 HQ recce plane, Model 2	Ki 462	Mitsubishi	Type 1, 1050 hp., 14 cyl., radial	Mitsubishi	Principal recce plane. Used by both JAAF and JNAF.
DINAH 3	Dinah Mk 3	2E-R	Type 100 HQ recce plane, Model 3	Ki 463	Mitsubishi	Ha 33, Model 62 (Ha 112, Model 2) 14 cyl. radial	Mitsubishi	In production.
CLARA 1	.....	2E-R	HQ recce plane	Ki 70	Tachikawa	Ha 42, Model 11, (Ha 104) 2000 hp., 18 cyl. radial	.....	May be in production.
EDNA 1	.....	2E-R	HQ recce plane	Ki 71	"Air Depot"	Ha 33, Model 51, (Ha 112) 14 cyl. radial	Mitsubishi	May be in production.

## ARMY BOMBERS

SALLY 1	Sally Mk 1	2E-B	Type 97 heavy bomber, Model 1	Ki 21	Mitsubishi	Type 97, 850 hp., 14 cyl. radial	Nakajima?	Obsolete. Used as trainer.
SALLY 2	Sally Mk 2	2E-B	Type 97 heavy bomber, Model 2	Ki 57?	Mitsubishi	Type 100, 1450 hp., 14 cyl. radial	Mitsubishi	Former SALLY Mks II and III now identified as Jap Model 2.
LILY 1	Lily Mk 1	2E-B	Type 99 light bomber, Model 1	Ki 48	Kawasaki	Type 99, 950 hp., 14 cyl. radial	Nakajima and Kawasaki	Obsolescent.
LILY 2	Lily Mk 2	2E-B	Type 99 light bomber, Model 2	Ki 482	Kawasaki	Type 2, 1150 hp., 14 cyl., radial	Nakajima and Kawasaki	Version with dive brakes may be LILY 3. Also used as trainer.
HELEN 1	Helen	2E-B	Type 100 heavy bomber, Model 1	Ki 49	Nakajima	Type 100, 1250 hp., 14 cyl. radial	Nakajima	Obsolescent.
HELEN 2	Helen	2E-B	Type 100 heavy bomber, Model 2	Ki 492	Nakajima	Type 2, 1450 hp., 14 cyl. radial	Nakajima	.....
HELEN 3	Helen	2E-B	Type 100 heavy bomber, Model 3	Ki 493	Nakajima	Ha 47, Model 11, (Ha 117) 2300 hp.	.....	Possibility-production status not known.

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Current Allied Code Name	Former Code Name	Recognition Type	Japanese		Assembled By	Engine	Engine Made By	Comments
			Description	Model-Type Symbols				

**ARMY BOMBERS—Continued**

PEGGY 1	.....	2E-B	.....	Ki 67	Mitsubishi	Ha 42, Model 11 (Ha 104) 2000 hp., 18 cyl. radial	Mitsubishi?	In production.
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**ARMY TRANSPORTS**

THORA 1	Thora	2E- Trans	Type 97 transport plane	Ki 34	Nakajima	Type 96, 650 hp., radial	Nakajima	Evolved from the Naka- jima "AT" Commer- cial.
THORA 2	Thora	2E- Trans	Type 97 transport plane	.....	Nakajima	Type 97, 650 hp., radial	Nakajima	.....
THELMA 1	Thelma	2E- Trans	Type RO transport plane	Ki 56	Kawasaki	Type 99, 950 hp., 14 cyl. radial	Nakajima and Kawa- saki	Evolved from the "Lockheed 14."
THELMA 1 (Cargo)	Thelma	2E- Trans	Type RO cargo trans- port plane	Ki 56	Kawasaki	Type 99, Model 2, 900 hp., 14 cyl. radial	Mitsubishi	.....
TOPSY 1	Topsy	2E- Trans	Type 100 transport plane, Model 1	Ki 57	Mitsubishi	Type 97, 850 hp., 14 cyl. radial	Nakajima	Evolved from the Mit- subishi "MC 20" Com- mercial.
THERESA 1	Theresa	2E- Trans	Type 1 trans- port plane	Ki 59	Nippon KK	Type 98, 450 hp., radial	Nakajima?	Evolved from the N. K. K. "T. K. 3" Com- mercial.

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## ROMAJI DESIGNATIONS OF CODED AIRCRAFT

## Code Names vs Japanese Names

EMILY (Transport)	SEIKU
FRANCES, Bomber	GINKA
FRANCES, Night Flying	HAKKO (and Kyokko)
GEORGE 11	SHIDEN
GRACE	RYUSEI
IRVING, Night Fighter	GEKKO
JACK	RAIDEN
JILL	TENZAN
JUDY, Bomber	SUISEI
LIZ	SHINZAN
LUKE	JINRAI
MYRT	SAIUN
NORM	SHIUN
PAUL	ZUIUN
REX	KYOFU
SAM	REPPU

## Japanese Names vs Code Names

GEKKO	IRVING, Night Fighter
GINKA	FRANCES, Bomber
HAKKO (and Kyokko)	FRANCES, Night Flying
JINRAI	LUKE
KYOFU	REX
RAIDEN	JACK
REPPU	SAM
RYUSEI	GRACE
SAIUN	MYRT
SEIKU	EMILY, (Transport)
SHIDEN	GEORGE
SHINZAN	LIZ
SHIUN	NORM
SUISEI	JUDY, Bomber
TENZAN	JILL
ZUIUN	PAUL

## "KI" NUMBERS OF CODED AIRCRAFT

KI Number	Code Name	Code Name	KI Number
21	SALLY	CLARA	70
27	NATE	DINAH	46
32	MARY	EDNA	71
34	THORA	FRANK	84
36	IDA	HELEN	49
43	OSCAR	IDA	36
44	TOJO	LILY	48
45	NICK	MARY	32
46	DINAH	NATE	27
48	LILY	NICK	45
49	HELEN	OSCAR	43
51	SONIA	PAT	74
56	THELMA	PEGGY	67
57*	TOPSY	ROB	64
59	THERESA	SALLY	21
61	TONY	SONIA	51
64	ROB	STEVE	73
67	PEGGY	THELMA	56
70	CLARA	THERESA	59
71	EDNA	THORA	34
73	STEVE	TOJO	44
74	PAT	TONY	61
84	FRANK	TOPSY*	57

\* Ki 57 markings have also been found on SALLY bombers.

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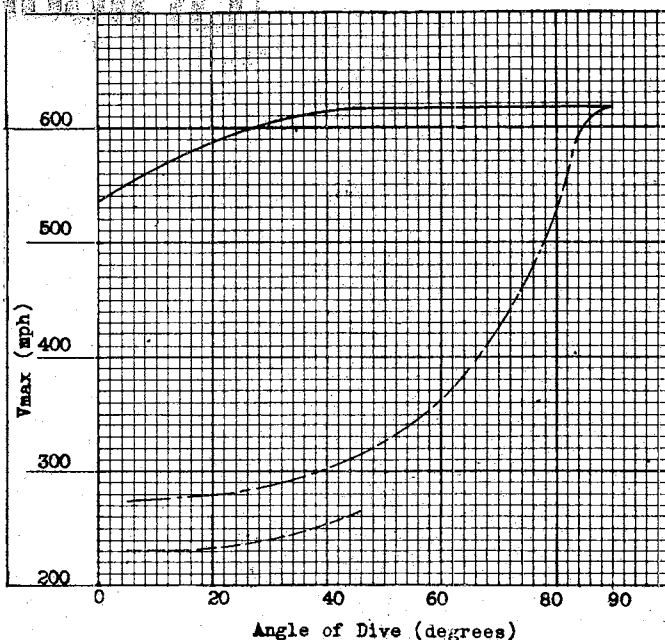


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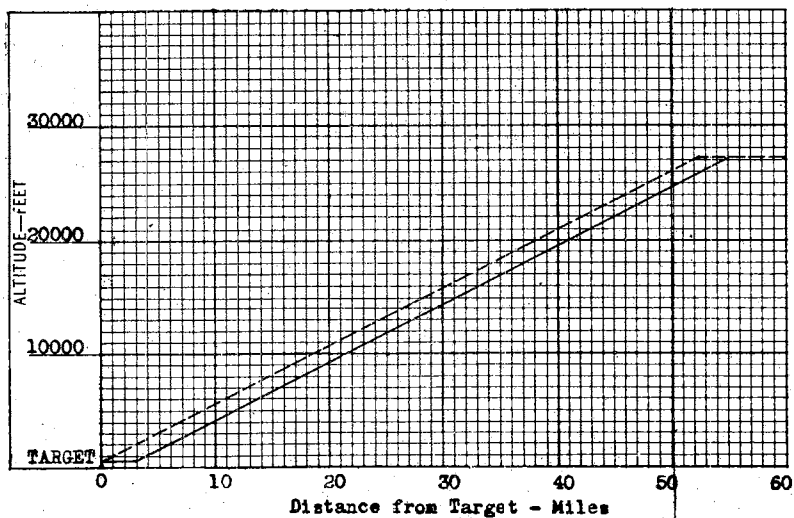
100A-1

BAKA

UNCLASSIFIED RANGE \* SPEED



KEY	CONDITION	WEIGHT (lb.)
————	Rockets	4536
-----	Average altitude (13,000') No Rockets	
- . - . - .	Sea level altitude. No Rockets	



KEY	CONDITION	WEIGHT (lb.)
-----	Rockets fired at launching	4536
————	Rockets fired at end of run	

DATE June 1945

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## PERFORMANCE

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## BAKA

## SPEED

@ 4536 lbs.	Mph.	Altitude
Maximum	540	Max. level speed with rockets
Maximum	620	In Dive with rockets.
Gliding	230	For max. range @ 50°35' glide angle.

## WARHEAD

	No.	Size	Total Lbs.
Normal	1	2645 lb. S.A.P.	2645

## AIRCRAFT

Duty Rocket Propelled Aircraft Bomb
Designation MXY7
Description Mid-wing, twin fin and rudder
Mfg. Fuji Kokuki K.K.
Engines None Crew 1
Construction Aluminum and wood

## WEIGHTS

	Lbs.
Gross	4536

## PROPULSION UNIT

Built-in 3 x Type 4 Mk 1  
Model 20 Rockets

## DIMENSIONS

Span 16'5"	Length 20' 1"
Height 3.9'	Wing area 64.7 sq. ft.

## RANGE

	Miles		Alt. feet	Bomb lbs.
	stat.	naut.		
Maximum range	55	48	27000 to S.L.	2645

## GENERAL DATA

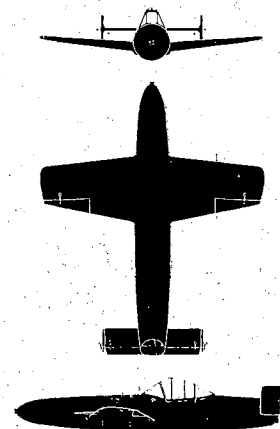
BAKA is first of all a glider, and secondly, a powered aircraft. Although the rockets greatly increase its speed for a short time, they cause only a slight increase over its max. glide range. Approximately 3 to 5 miles level flight are possible with rocket propulsion.

Against ships, the rockets will presumably be used at the end of the run in a torpedo approach in an attempt to score a hit close to the water line.

Lacking maneuverability, BAKA can take little evasive action. Its only method of escape from fighters would be to fire one or more of its rockets.

BAKA is normally carried by BETTY although it may possibly be carried by HELEN, PEGGY, SALLY, RITA. The importance of destruction of the parent aircraft cannot be over emphasized.

For further information on BAKA, see TAIC Summary No. 31.



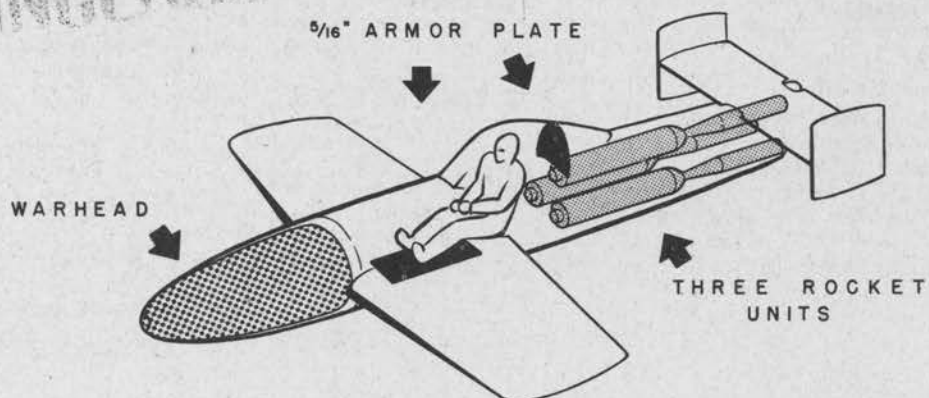
DATE June 1945

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## BAKA

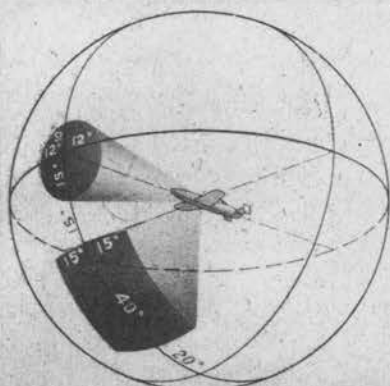
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## VULNERABILITY

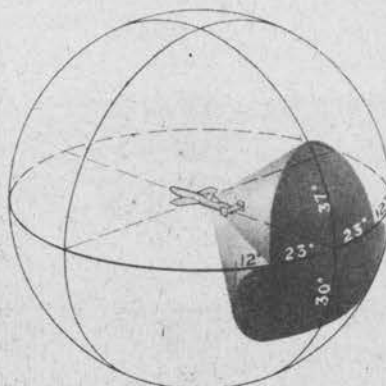


## FIELDS OF PROTECTION

It has been assumed that the rocket units, warhead and armor plate provide protection.



PROTECTION AFFORDED  
PILOT BY WARHEAD AND  
ARMOR PLATE ON FLOOR  
3/4-front view from below



PROTECTION AFFORDED  
PILOT BY BACK ARMOR PLATE  
AND THE ROCKET UNITS  
3/4-rear view from above

DATE June 1945

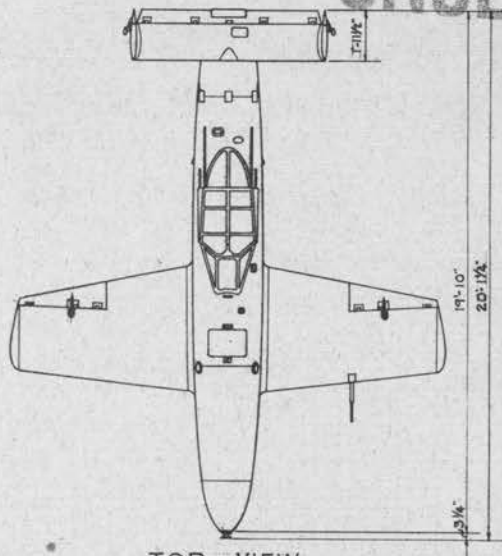
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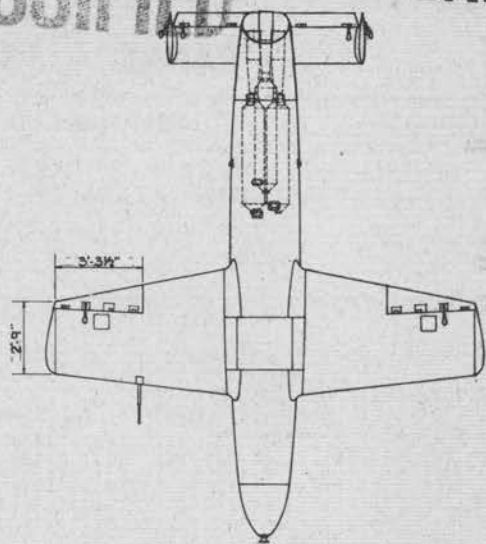
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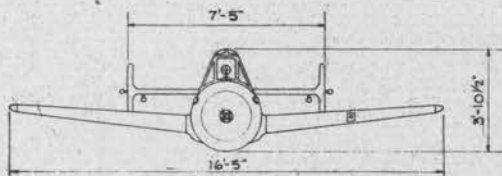
BAKA



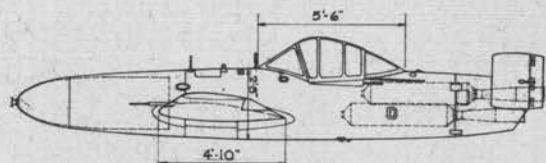
TOP VIEW



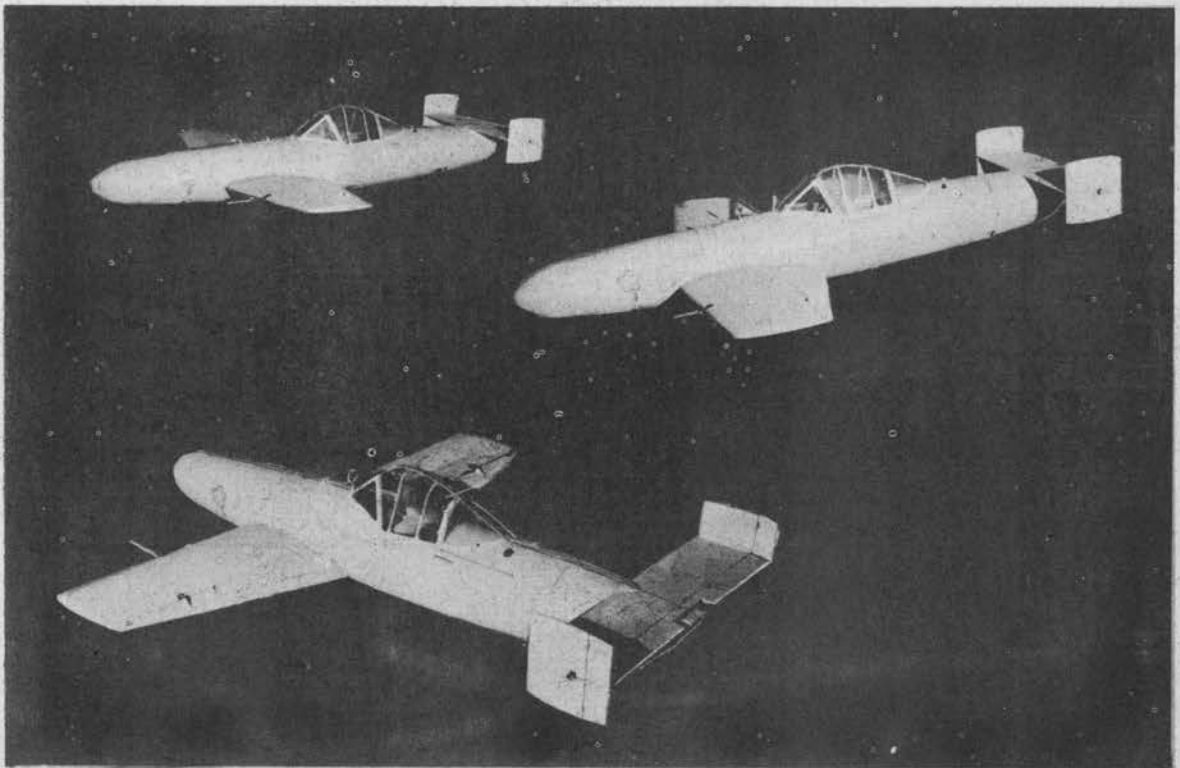
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



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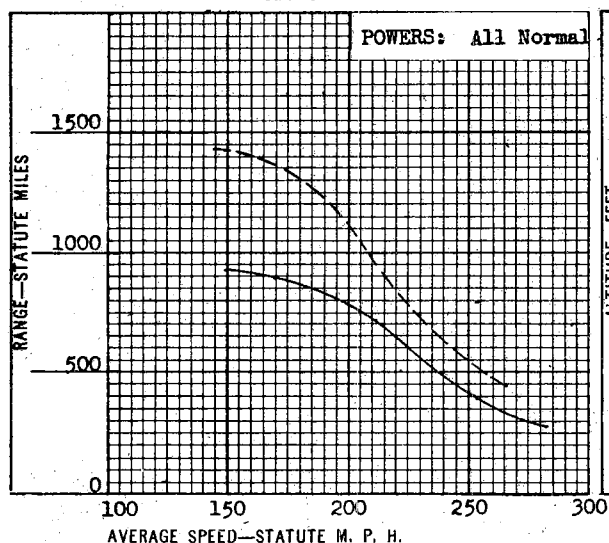
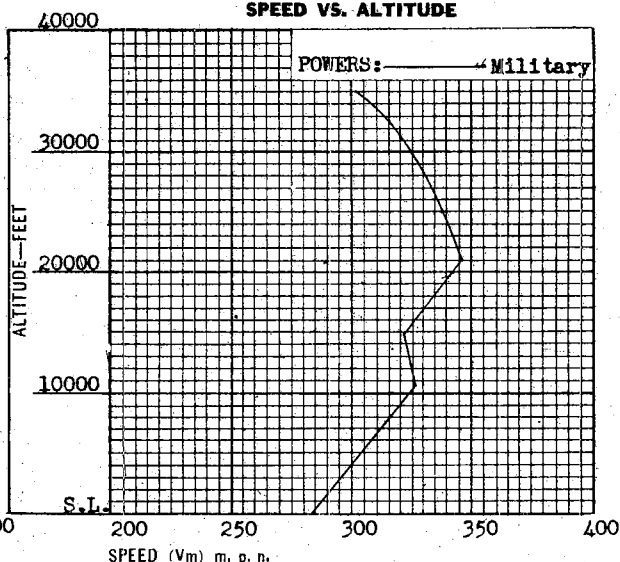
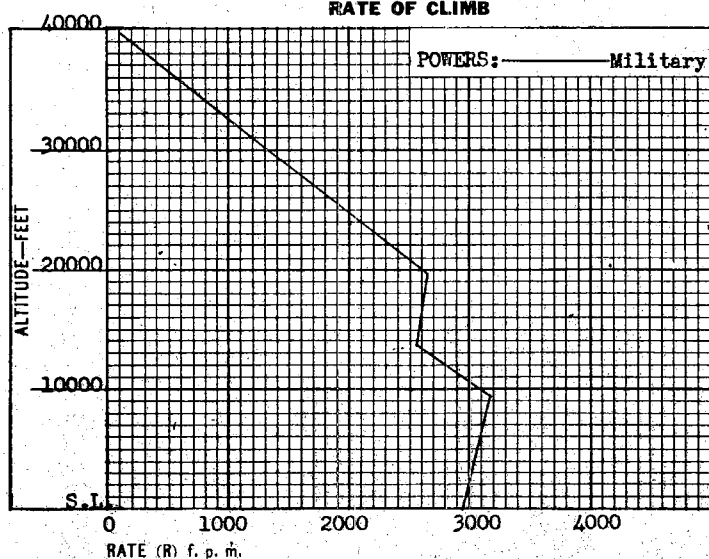
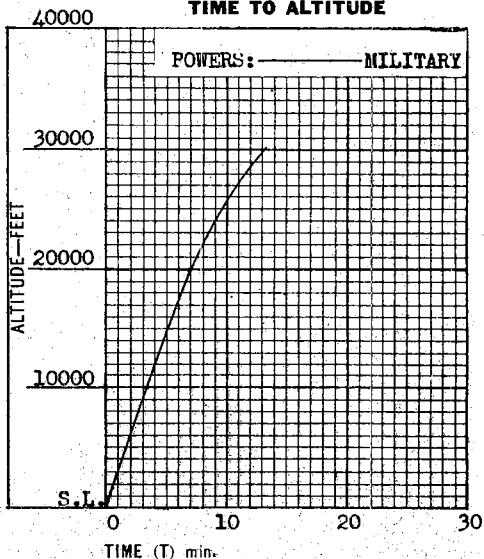
DATE June 1945

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# **ZEKE 32 (HAMP)**

## **RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
	NORMAL FIGHTER	5650	762	None
	OVERLOAD FIGHTER	6260	1284	None

**RANGE VS. SPEED****SPEED VS. ALTITUDE****RATE OF CLIMB****TIME TO ALTITUDE**

DATE December 1944

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## PERFORMANCE AND CHARACTERISTICS

102C-2

## ZEKE 32 (HAMP)

### TAKE-OFF

	Load	Feet
T.O. calm	5650	492
T.O. 25 kt. wind	5650	202
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 5650 lbs.	Feet	Min.
Rate @ S.L.	2960	1
Rate @ 19,700 ft.	2640	1
Time to 10,000'		3.3
Time to 20,000'		7.0
Service ceiling 39,800'		

### AIRCRAFT

Duty Fighter
Designation Type O, Model 32
Description Low-wing Monoplane
Mfg. Mitsubishi
Engines 1 Crew 1
Construction All Metal

### SPEED

@ 5650 lbs.	Mph.	Knts.	Altitude
Maximum	284	246	@ S. L.
Maximum	346	300	@ 21,000'
Cruising 75%	200	174	1,500'
Economical			

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	2	60 kg.	264

### ENGINES

	H. P.	Altitude
Take-off	1115	S.L.
Normal	980	6,500'
	860	16,500'
Military	1085	9,400'
	965	19,700'
War Emerg.	1180	7,500'

### WEIGHTS

	Lbs.
Empty	4060
Gross	5650
Overload	6250

### FUEL

	U.S. gal.	Imp. gal.
Built-in	127	106
Internal (Removable)		
External (drop)	87	72
Maximum	214	178

Mfg. Nakajima & Ishikawajima

Model Sakae 21

Type Radial

Cylinders 14 Cooling Air

Supercharger 2 Speed

Propeller 3 Blade CSDiam. 10.0'

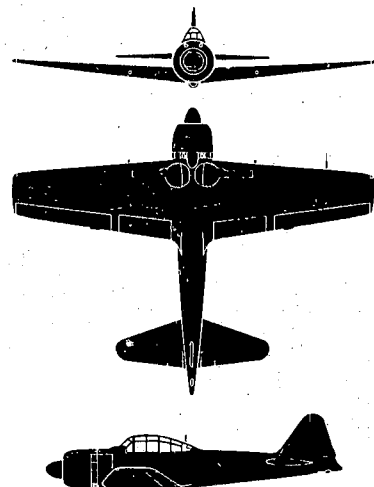
Fuel - Take-off 92 Cruising 92

### RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1435	1255	144	125	1500	214	178	None	None
At 75% Vmax.	1130	981	200	174	1500	214	178	None	None
Maximum range (normal fuel)	925	803	150	130	1500	127	106	None	None
Radius ( )									
Radius ( )									

### DIMENSIONS

Span 36.2	Length 29.8
Height 9.2'	Wing area 233 sq.ft.



### GENERAL DATA

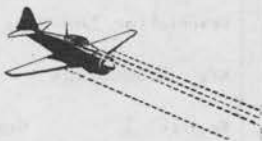
ZEKE 32 believed out of production and will be encountered less frequently from now on.

DATE December 1944

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## ZEKE 32 (HAMP)

## FIELDS OF FIRE

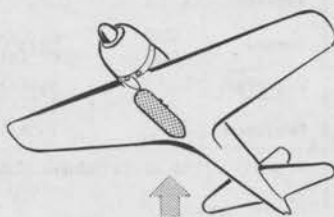


FORWARD GUNS "A", "B" AND "C"  
3/4-front view from above

## EXHAUST FLAME PATTERNS

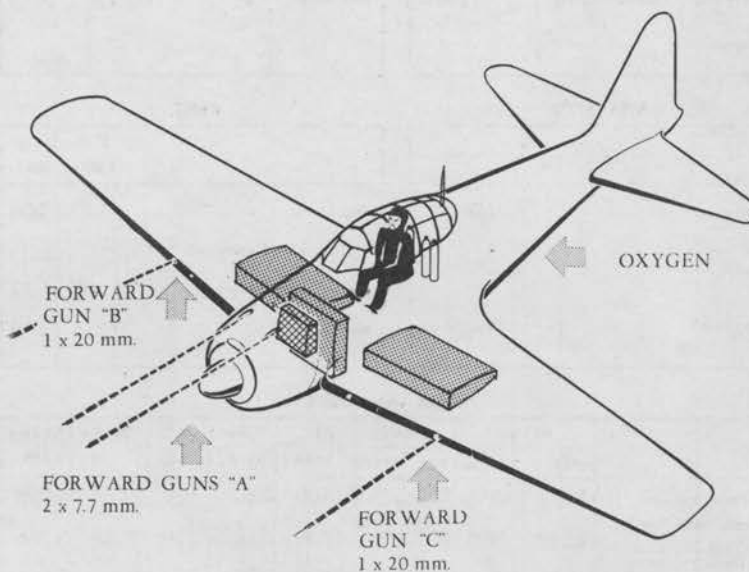


REAR VIEW



Auxiliary gas tank  
Jettisonable

## VULNERABILITY



## LEGEND

Fuel tanks, unprotected



Fuel tanks, self-sealing



Oil tanks, unprotected



Oil tanks, self-sealing



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7 mm	500	Fixed	Tail				
Top	2	20 mm	60	Fixed	Wing				
Side									
Bottom									

## TACTICAL DATA

Some late models have improved 20 mm cannon in wings—protrude from leading edge about 19 inches.

Effective range approx.  
600 - 700 yards.

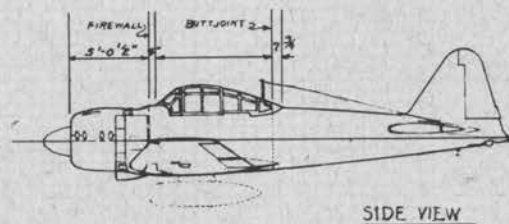
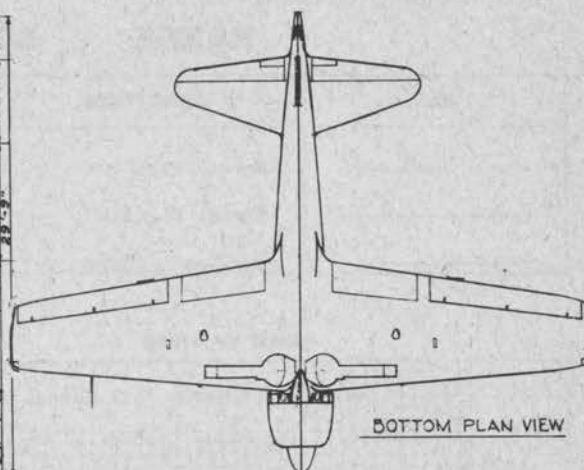
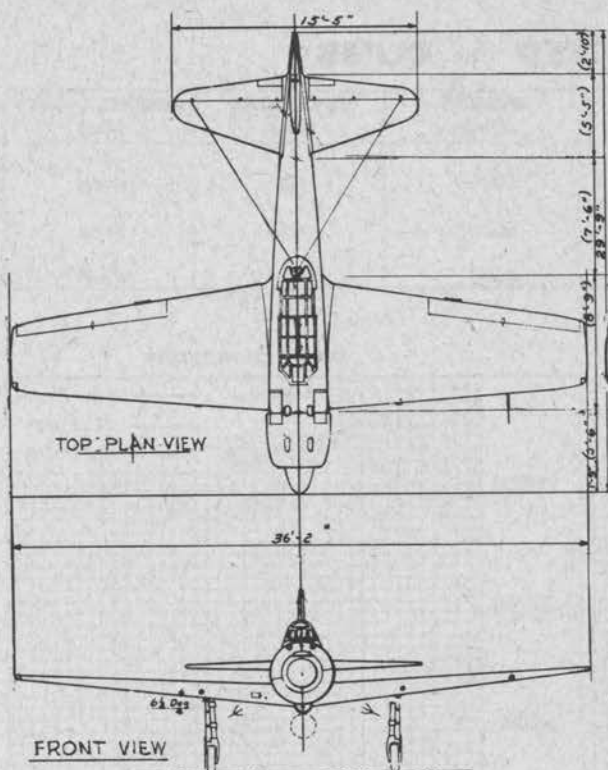
DATE December 1944

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102C-4

## ZEKE 32 (HAMP)



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DATE December 1944

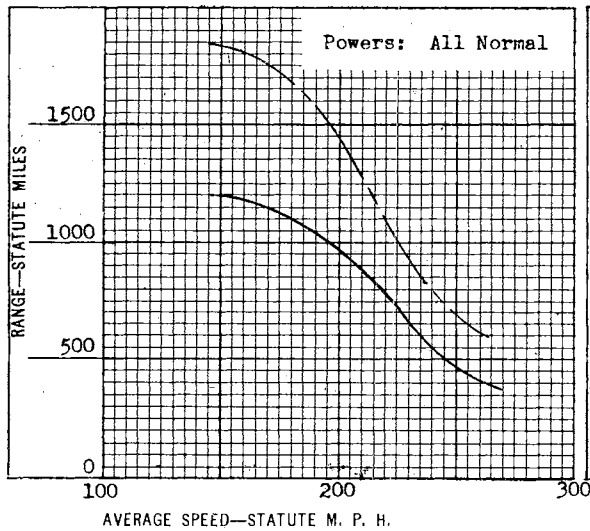
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## ZEKE 52

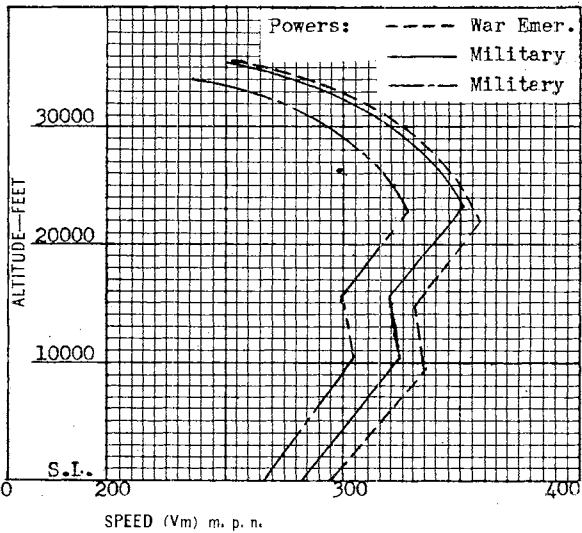
### RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	Normal Fighter	6026	936	None
_____	Normal Fighter	6026	936	None
_____	Overload Fighter	6600	1510	None

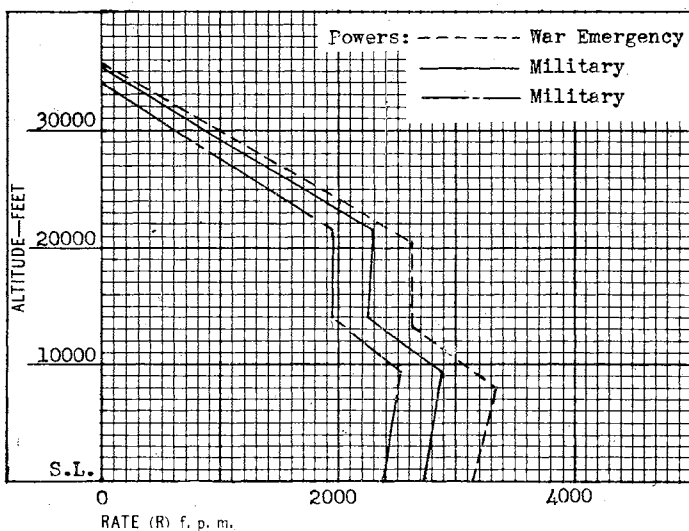
#### RANGE VS. SPEED



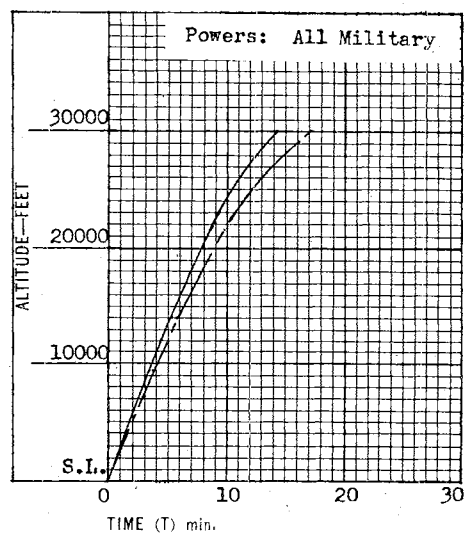
#### SPEED VS. ALTITUDE



#### RATE OF CLIMB



#### TIME TO ALTITUDE



DATE March 1945

# UNCLASSIFIED

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102D-2

## PERFORMANCE AND CHARACTERISTICS

## ZEKE 52

## TAKE-OFF

	Load	Feet
Runway	6026	975
Requirements		
T.O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

## CLIMB—CEILING

@ 6026 lbs.	Feet	Min.
Rate @ S.L.	3140	1
Rate @ 8,000 ft.	3340	1
Time to 10,000'		3.6
Time to 20,000'		7.8
Service ceiling	35,100'	

## AIRCRAFT

Duty Fighter
Designation Type O Model 52
Description Low-wing Monoplane
Mfg. Mitsubishi & Nakajima
Engines 1 Crew 1
Construction All Metal

## SPEED

@ 6026 lbs.	Mph.	Knts.	Altitude
Maximum VVE	295	256	@ S. L.
Maximum WE	358	310	@ 22,000'
Military Cruising	351	304	23,100'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum or	2 10	60 kg 32 kg	264 704

## ENGINES

	H. P.	Altitude
Take-off	1120	S.L.
Normal	830	1500'
Military	1080 950	9300' 21600'
War Emerg.	1210	8000'

## WEIGHTS

	Lbs.
Empty	4236
Gross Normal	6026
Overload	6600

## FUEL

	U.S. gal.	Imp. gal.
Built-in	156	129
Internal (Removable)		
External (drop)	87	72
Maximum	243	201

Mfg. Nakajima
Model Sakae 31 A
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3-Blade Diam. 10'
C.S.
Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

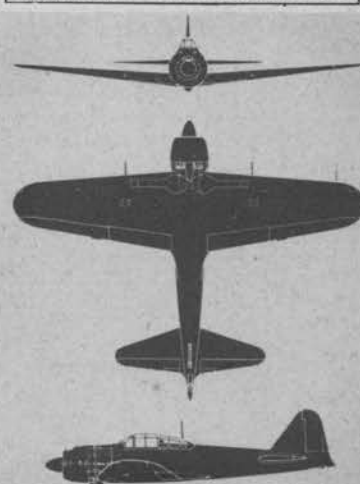
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1844	1600	146	126	1500	243	201	None	None
At 75% Vmax.	1478	1630	198	172	1500	243	201	None	None
Maximum range (normal fuel)	1200	1042	146	126	1500	156	129	None	None
At 75% Vmax.	948	823	202	175	1500	156	129	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 36.1'	Length 29.8'
Height 9.2'	Wing area 230 sq.ft.

## GENERAL DATA

A maximum speed of only 340 mph has been obtained in flight tests.



RESTRICTED

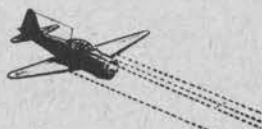
DATE March 1945

UNCLASSIFIED



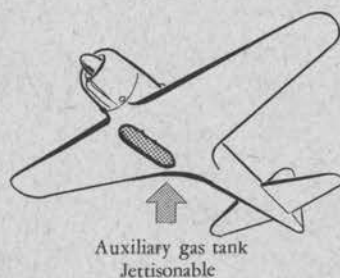
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## EXHAUST FLAME PATTERNS

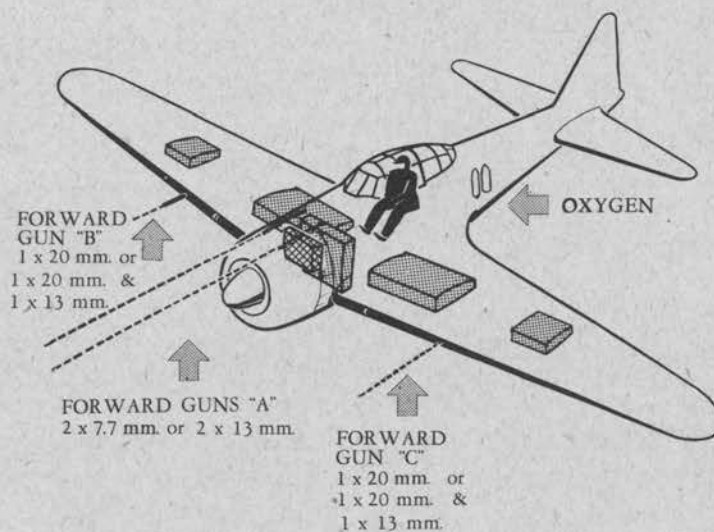
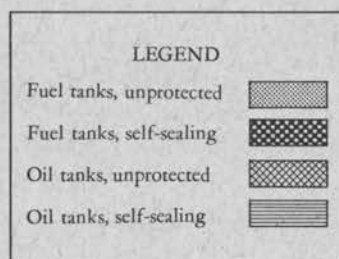


A black and white photograph showing the silhouette of a biplane from a rear perspective. The aircraft is centered in the frame, flying away from the viewer. The background is a light, mottled grey, suggesting a sky or a textured surface. The silhouette is dark and clearly defined against the lighter background.

REAR VIEW



## VULNERABILITY



### TACTICAL DATA

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Cowl	2	7.7 mm or	700	Fixed	Tail				
Top	2	13.2 mm		Fixed	Wing	2	20 mm or	100	Fixed
Side						2	20 mm and	100	Fixed
Bottom						2	13.2 mm		Fixed

**DATE** March 1945

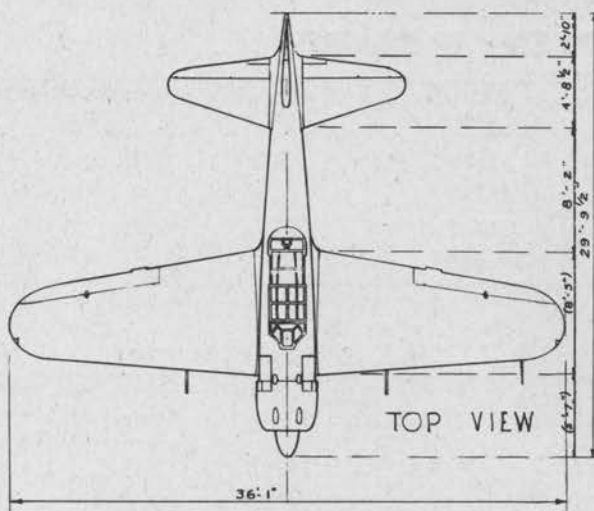
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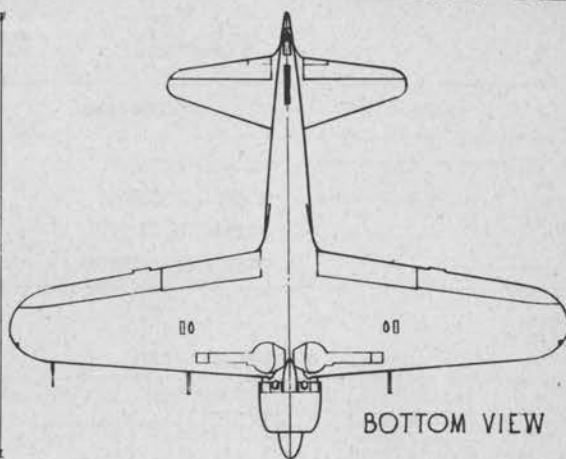
# UNCLASSIFIED

102D-4

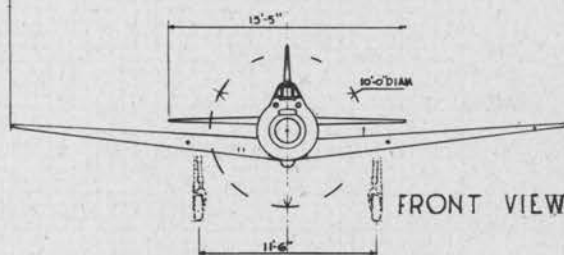
## ZEKE 52



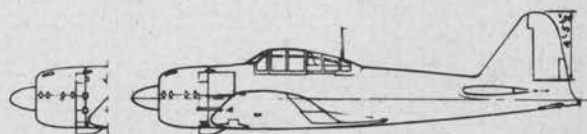
TOP VIEW



BOTTOM VIEW

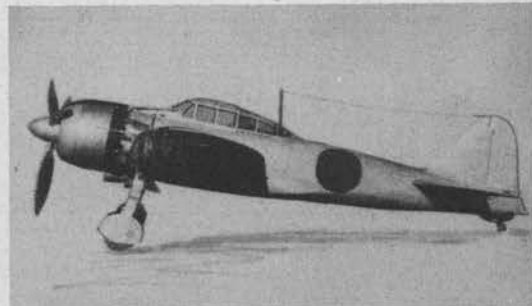


FRONT VIEW



SIDE VIEW

ALTERNATE ARRANGEMENT  
OF EXHAUST STACKS



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DATE March 1945

# UNCLASSIFIED



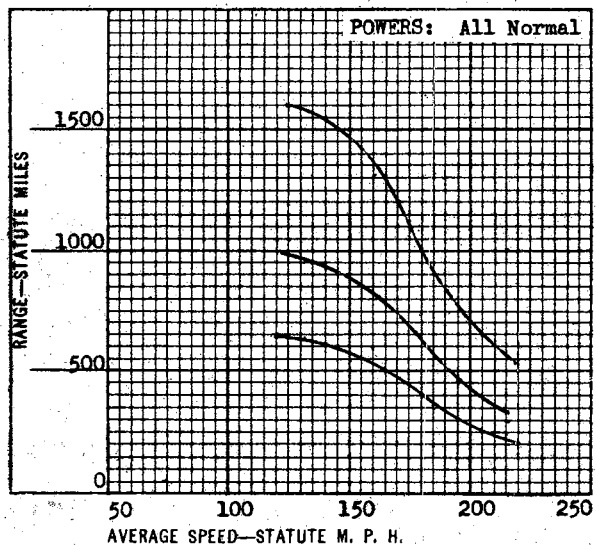
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RUF 11

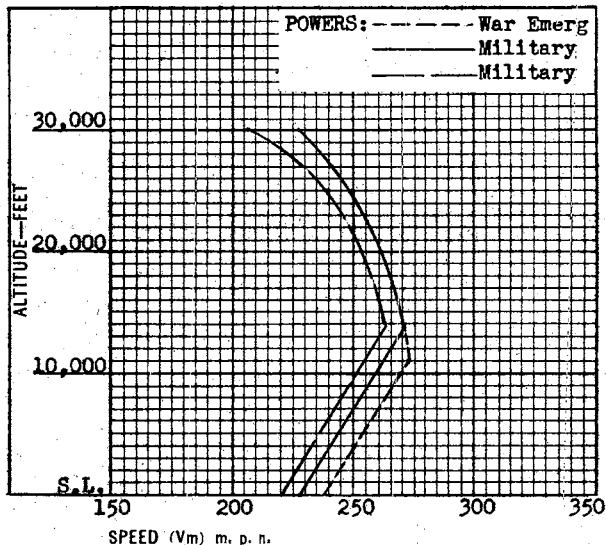
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL FIGHTER	5420	522	None
-----	NORMAL FIGHTER	5420	522	None
————	OVERLOAD FIGHTER	6140	867	265
-----	OVERLOAD FIGHTER	6405	1395	None

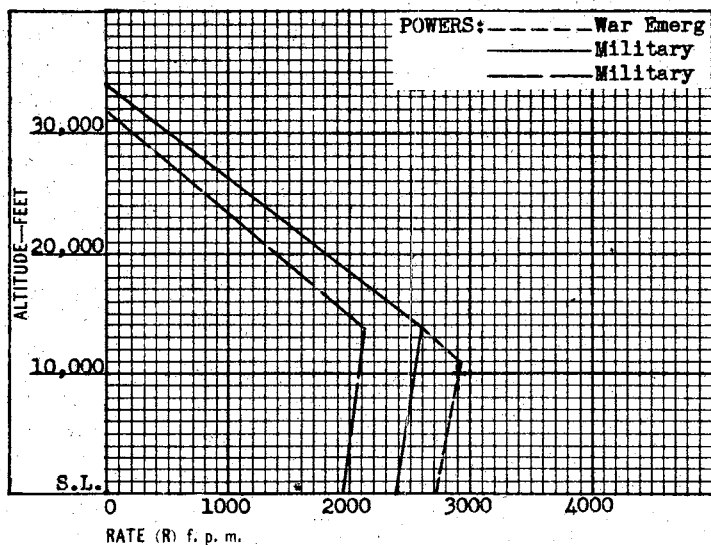
RANGE VS. SPEED



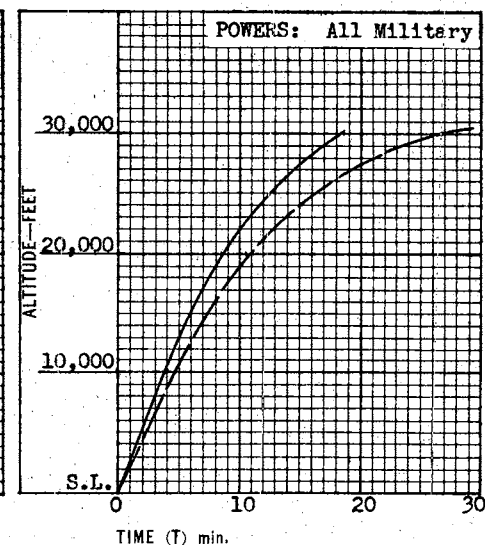
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE May 1945

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## PERFORMANCE AND CHARACTERISTICS

RUF 11

## TAKE-OFF

	Load	Feet
T. O. calm		
T. O. 25 kt. wind		
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 5420	lbs.	Feet	Min.
Rate @ S. L.		2730	1
Rate @ 16,600 ft.		2930	1
Time to 10,000'			4.0
Time to 20,000'			8.5
Service ceiling 32,900			

## AIRCRAFT

Duty Seaplane Fighter
Designation Type 2, Model 11
Description Low-wing central floatplane
Mfg. Nakajima
Engines 1 Crew 1
Construction All Metal; semi-monocoque fuselage, cantilever wing.

## SPEED

@ 5420	lbs.	Mph.	Knts.	Altitude
Maximum		238	207	@ S. L.
Maximum		272	236	@ 13,900'
Cruising - Combat	220	191	@	1500'
Economical - Cruising	120	104	@	1500'

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum	2	60 kg	265

## ENGINES

	H. P.	Altitude
Take-off	925	S.L.
Normal	705	1500'
Military	820	S.L.
	935	13,900'
War Emerg.	925	S.L.
	1010	11,000'

## WEIGHTS

	Lbs.
Empty	3205
Gross	5420
Overload (Fuel)	6405

## FUEL

	U. S. gal.	Imp. gal.
Built-in	233	194
Internal (Removable)		
External (drop)		
Maximum		

Mfg. Nakajima
Model Sakae 12
Type Radial
Cylinders 14 Cooling Air
Supercharger Single Speed
Propeller 3 BlC.S. Diam. 9.52'
Fuel-Take-off 92 Cruising 92

## RANGE AND RADIUS

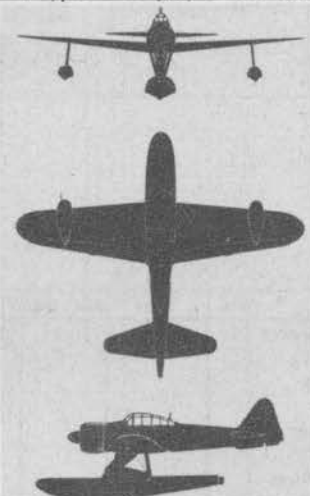
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1600	1390	125	109	1500	233	194	None	
Range @ Combat Cr	535	464	219	190	1500	233	194	None	
Maximum range (normal fuel)	640	556	120	104	1500	87	73	None	
Range @ Combat Cr	205	178	220	191	1500	87	73	None	
Radius ( )									
Max. Range - Bomb	997	865	122	106	1500	145	121	265	
Radius ( )									

## DIMENSIONS

Span 39.4'	Length 33.8'
Height 14'	Wing area 241.3 sq. ft.

## GENERAL DATA

RUF 11 is a Navy Float Plane used for fighter, observation and training duties. Except for changes in the tail, location of the oil cooler, and the addition of a fuel tank in the main float, RUF 11 is basically the same as ZEN 21.



RESTRICTED

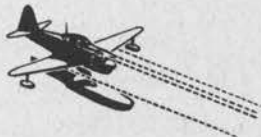
DATE May 1945

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## RUF 11

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## FIELDS OF FIRE



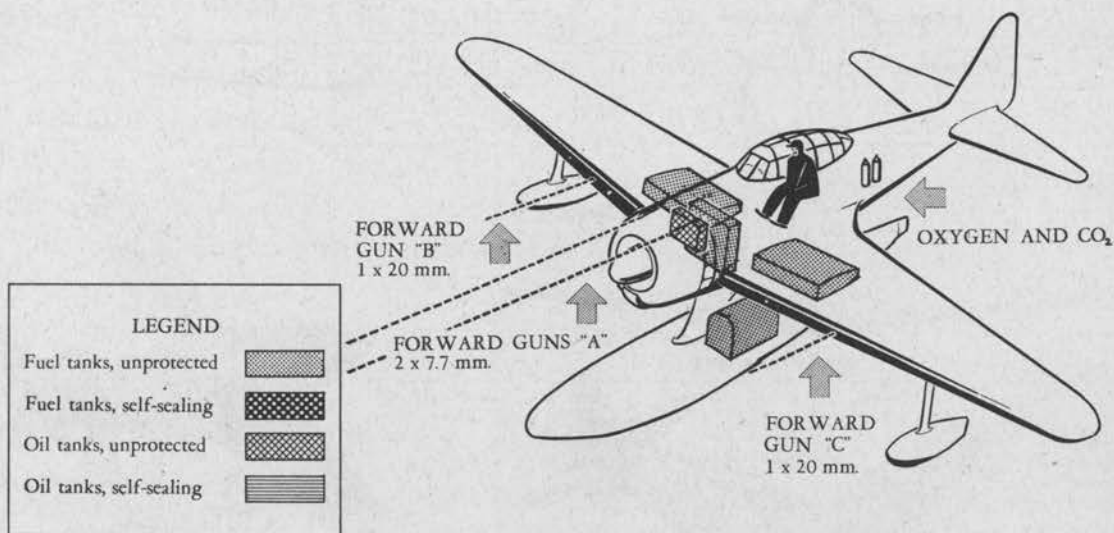
FORWARD GUNS "A", "B" AND "C"  
3/4-front view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7mm	500	Fixed	Tail				
Top					Wing	2	20 mm	60	Fixed
Side									
Bottom									

## TACTICAL DATA

No protection is provided for the pilot or fuel tanks. There are two tanks in the wing roots and one in the main float. The float tank can be purged with CO<sub>2</sub>.

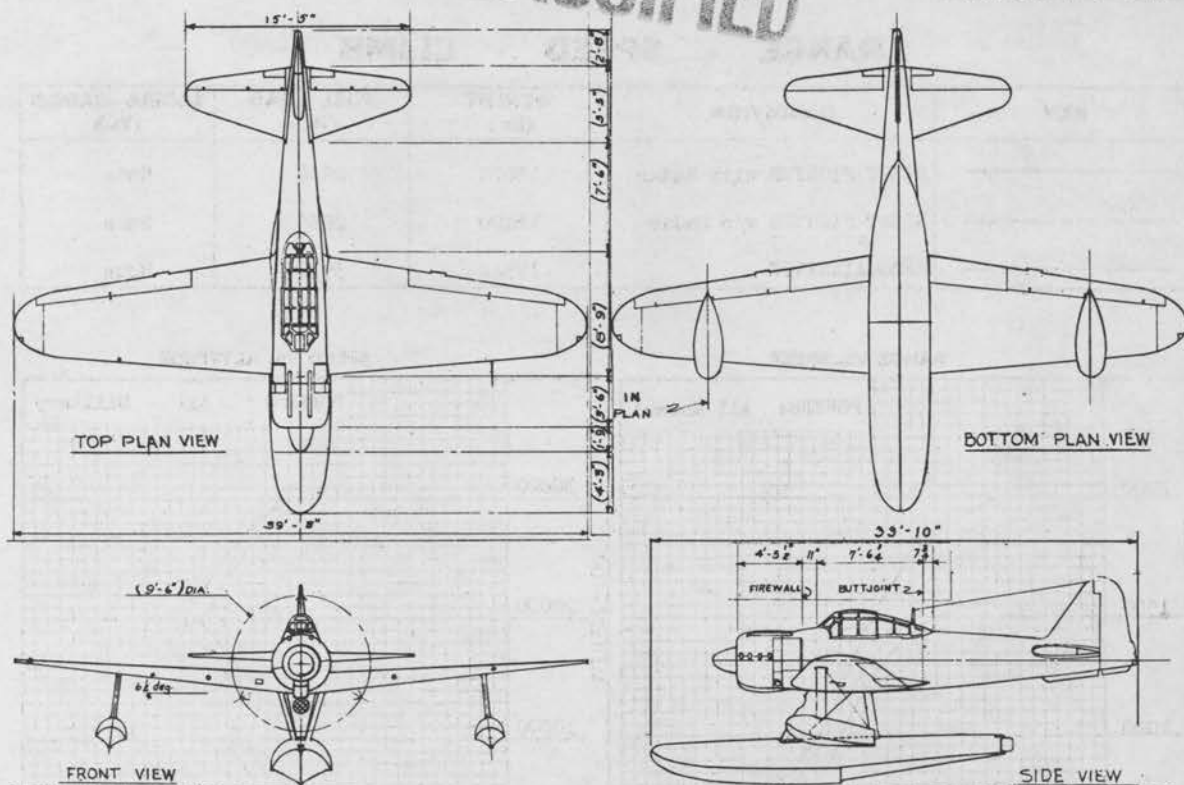
DATE December 1944

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RUFÉ 11



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DATE December 1944

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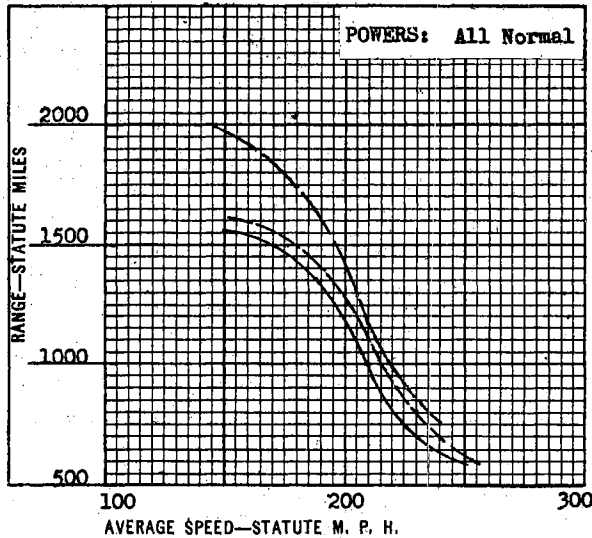
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## IRVING 11

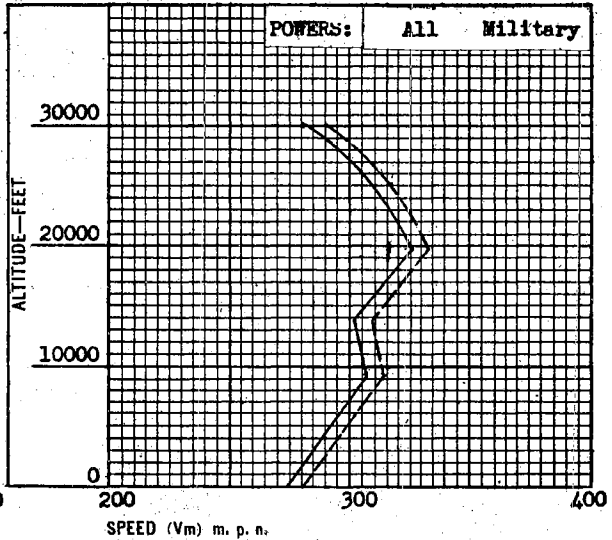
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
—————	NIGHT FIGHTER with Radar	16600	2886	None
-----	NIGHT FIGHTER w/o Radar	16400	2886	None
_____	RECONNAISSANCE	17544	3930	None

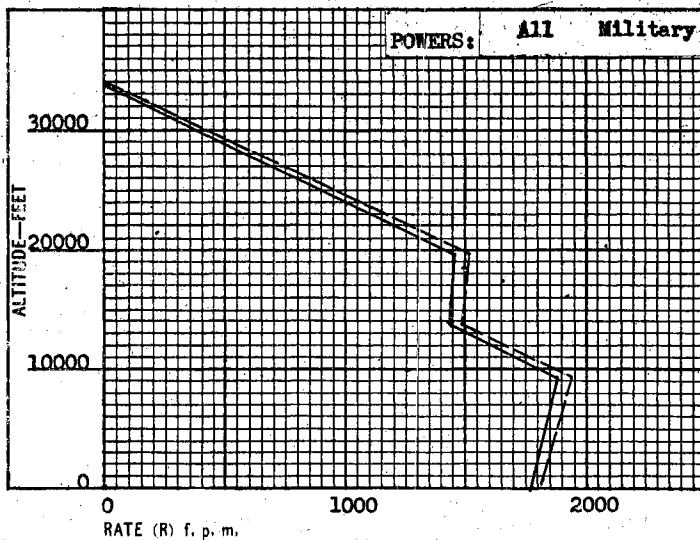
RANGE VS. SPEED



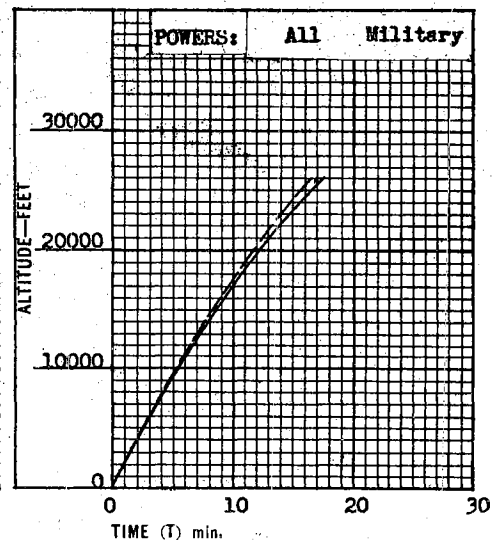
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE December 1944

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## PERFORMANCE AND CHARACTERISTICS

## IRVING 11

## TAKE-OFF

	Load	Feet
T. O. calm	16600	1075
T. O. 25 kt. wind	16600	510
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 16,600	lbs.	Feet	Min.
Rate @ S. L.		1780	1
Rate @ 9,350'		1880	1
Rate @ 19,700 ft.		1460	1
Time to 10,000'			5.5
Time to 20,000'			12.1
Service ceiling 32,740'			

## AIRCRAFT

Duty Night Fighter
Designation (GEKKO) Model 11
Description Low-wing Monoplane
Mfg. Nakajima
Engines 2 Crew 2
Construction All metal

## SPEED

@ 16,600 lbs.	Mph.	Knts.	Altitude
Maximum	274	237	@ S. L.
Maximum	333	288	@ 19,700'
Cruising 75%	188	163	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum	2	250kg	1100

## ENGINES

	H. P.	Altitude
Take-off	1115	S. L.
Normal		
Military	1085	9,350'
War Emerg.	965 1180	19,700' 7,500'

## WEIGHTS

	Lbs.
Empty	10,700
Gross (Night Fighter)	16,600
Overload (Reconnaissance)	17,544

## FUEL

	U.S. gal.	Imp. gal.
Built-in	492	408
Internal (Removable)		
External (drop)	174	144
Maximum	666	552

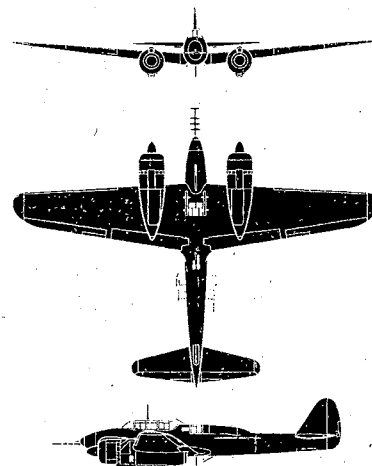
Mfg. Nakajima
Model Sakae 21
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 blade C.S.Diam. 10'
Fuel—Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1985	1725	145	126	1500	666	552	None	None
@ 75% VM	1745	1515	181	157	1500	666	552	None	None
Maximum range (normal fuel)	1560	1354	150	130	1500	492	408	None	None
@ 75% VM	1360	1080	188	163	1500	492	408	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 55.7'	Length 99.9'
Height 15'	Wing area 430 sq.ft.



## GENERAL DATA

IRVING carries radar and may be used either as a night fighter or for reconnaissance. Except for "Maximum Range with Maximum Fuel", the above figures are based on the night fighter version.

Auxiliary fuel tanks are known to be carried but the 2 x 87 gallon tanks are assumptions.

Internal fuel and lube oil tanks are self-sealing.

DATE December 1944

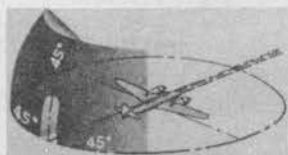
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## IRVING 11

## FIELDS OF FIRE



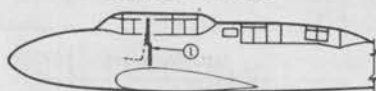
FORWARD GUNS "A", AND  
"B" AND TOP GUN "C"  
3/4-rear view from above  
Reconnaissance  
Version



Reconnaissance Version  
3/4-front view from above

Fuel and Oil tanks and oxygen cylinders  
are same on both versions

## ARMOR PLATE



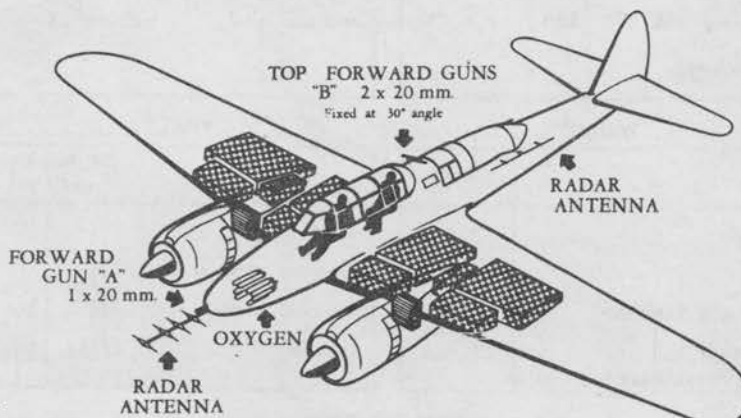
9.5 mm.  
I  
Viewed from rear

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY



NOTE:  
Alternate nose carries landing light  
in place of gun and radar antenna

Night Fighter  
Version

## LEGEND

Fuel tanks, unprotected

Oil tanks, unprotected

Fuel tanks, protected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun.	Type		No.	Size	Rds. Gun	Type
Forward	1	20 mm (Not always found)	100	Fixed	Tail				
Top	2	20 mm	100	Fixed	Wing				
Side									
Bottom	2	20 mm	100	Fixed					

## TACTICAL DATA

The top and bottom 20 mm guns are mounted to face forward at a fixed angle of 30° from the longitudinal axis of the fuselage.

Armor plate is installed to protect the pilot's back and head.

Armament has varied considerably in recon versions.

DATE December 1944

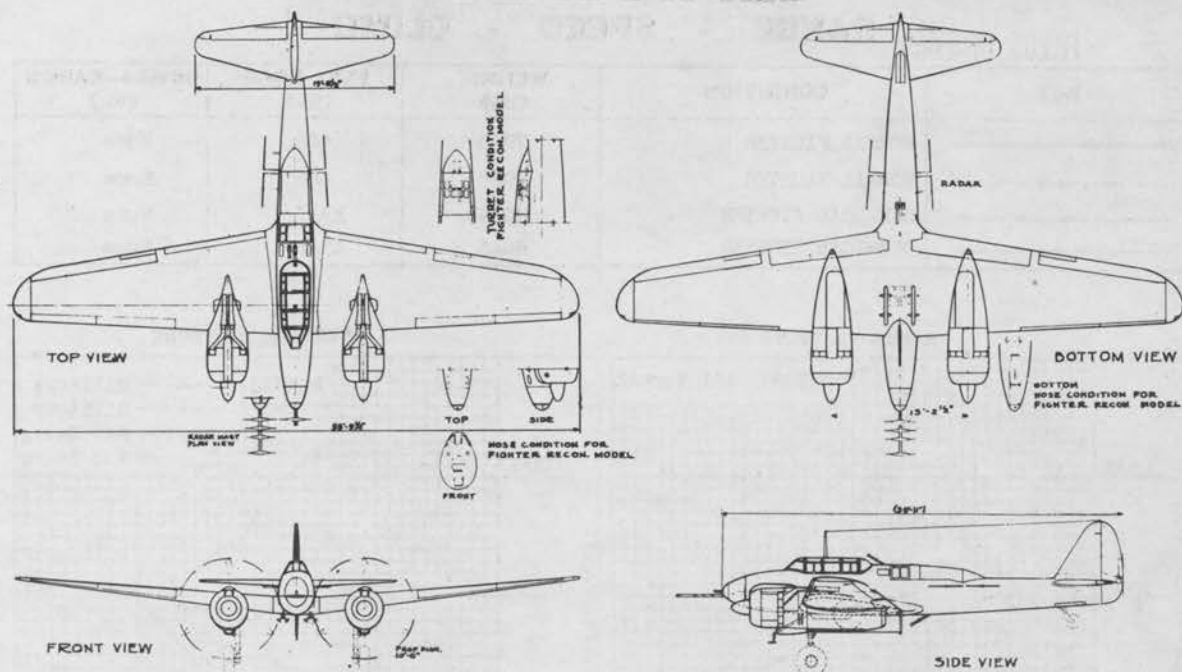
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IRVING 11



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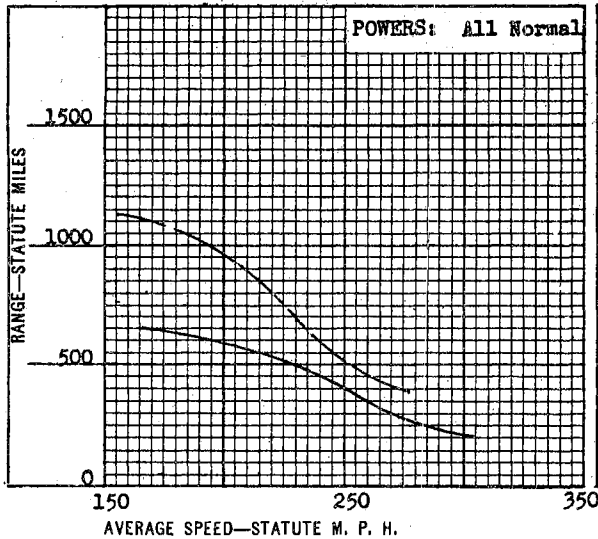
DATE December 1944

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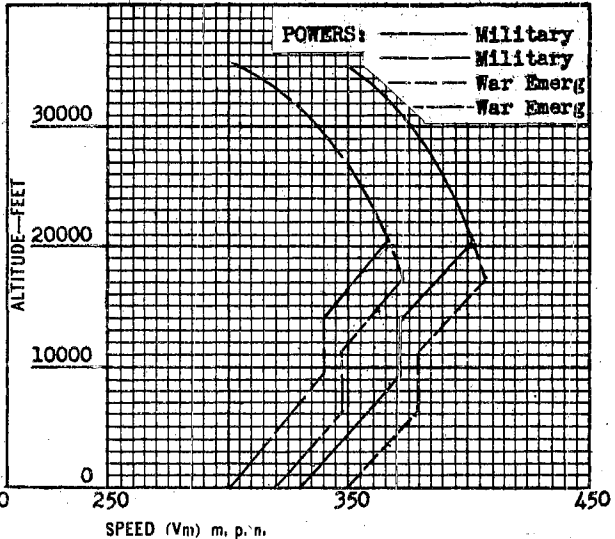
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL FIGHTER	7080	666	None
-----	NORMAL FIGHTER	7080	666	None
=====	OVERLOAD FIGHTER	8045	1347	None
=====	OVERLOAD FIGHTER	8045	1347	None

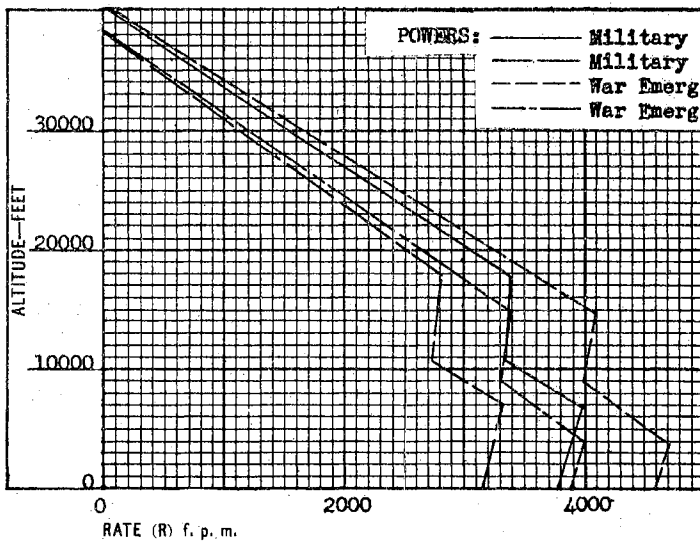
RANGE VS. SPEED



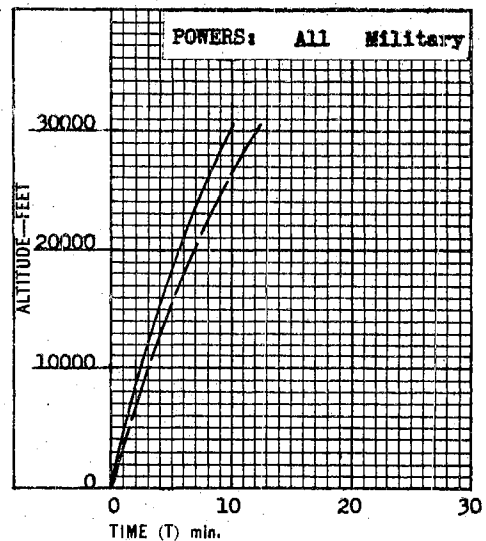
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



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105A-2

## PERFORMANCE AND CHARACTERISTICS

JACK 11

## TAKE-OFF

	Load	Feet
T. O. calm	7080	585
T. O. 25 kt. wind	7080	261
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 7080	lbs.	Feet	Min.
Rate @ S. L.		4600	1
Rate @ 14,800 ft.		4080	1
Time to 10,000'			2.6
Time to 20,000'			5.6
Service ceiling 37,500'			

## AIRCRAFT

Duty Fighter
Designation (RAIDEN) Model 11
Description Low-wing Monoplane
Mfg. Mitsubishi
Engines 1 Crew 1
Construction All metal

## SPEED

@ 7080	lbs.	Mph.	Knts.	Altitude
Maximum	350	304	@ S. L.	
Maximum	407	355	@ 17,400'	
Cruising 75%	228	197	1,500'	
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	2 x	35 kg.	154

## ENGINES

	H. P.	Altitude
Take-off	1870	S.L.
Normal	1370	9,850'
Military	1580	S.L.
War Emerg.	1560	17,900'
	1940	4,400'

## WEIGHTS

	Lbs.
Empty	5178
Gross	7080
Overload	8045

## FUEL

	U.S. gal.	Imp. gal.
Built-in	109	90
Internal (Removable)	48	40
External (drop)	66	55
Maximum	223	185

Mfg. Mitsubishi
Model KASEI 23
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 4 blade C.S. Diam. 10.8'
Fuel—Take-off 92 Cruising 92 plus methanol

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1127	968	156	135	1500	223	185	154	None
At 75% Vmax.	912	795	208	180	1500	223	185	154	None
Maximum range (normal fuel)	650	564	165	143	1500	109	90	None	None
At 75% Vmax.	508	440	228	197	1500	109	90	None	None
Radius ( )									
Radius ( )									

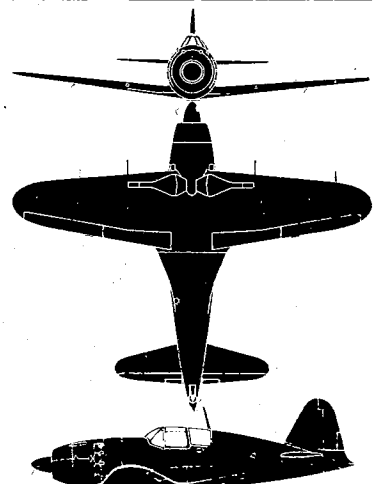
## DIMENSIONS

Span 35.4'	Length 31.8'
Height 12.9'	Wing area 216 sq. ft.

## GENERAL DATA

JACK is cleanly designed. The fact that it has a short range and high rate of climb indicates that it will be used as an interceptor fighter. It can carry a small bomb under each wing which will probably be employed for air to air attack against bomber formations.

Wing fuel tanks are not used under Gross Load. A jettisonable belly tank and 2 x 35 kg external bombs are allowed for under "Maximum Range".



DATE December 1944

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## JACK 11

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## FIELDS OF FIRE



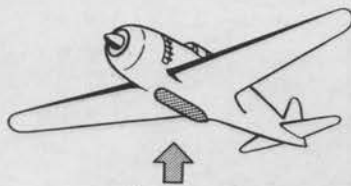
FORWARD GUNS  
"A", AND "B"  
3/4-front view from above

## EXHAUST FLAME PATTERNS



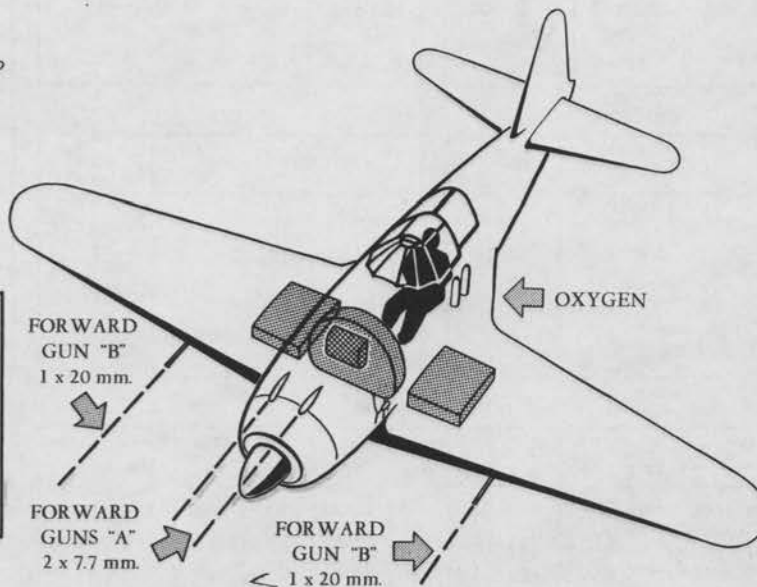
REAR VIEW

## VULNERABILITY



Auxiliary gas tank  
Jettisonable

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	



## ARMAMENT

	No.	Size	Rds. Gun.	Type		No.	Size	Rds. Gun.	Type
Forward	4	20 mm	100	Fixed	Tail				
or	2	7.7mm	550	Fixed	Wing				
Top and	2	20 mm	100	Fixed					
Side									
Bottom									

## TACTICAL DATA

JACK is more powerful and heavily armed than previous Japanese fighters. Probably less maneuverable than ZEKE but superior in diving and climbing at high speeds.

No armor or fuel protection have been indicated.

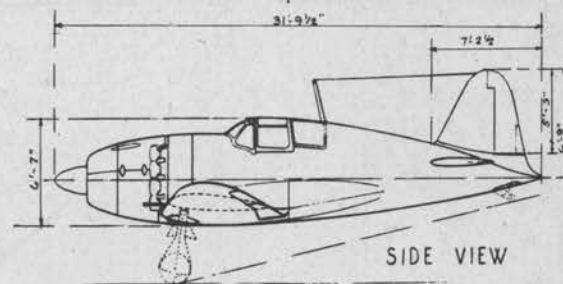
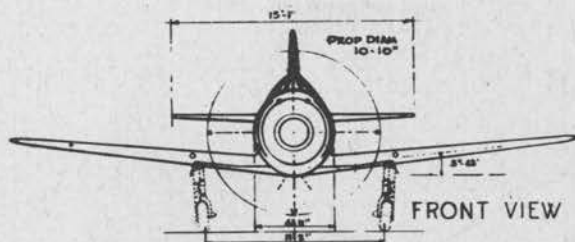
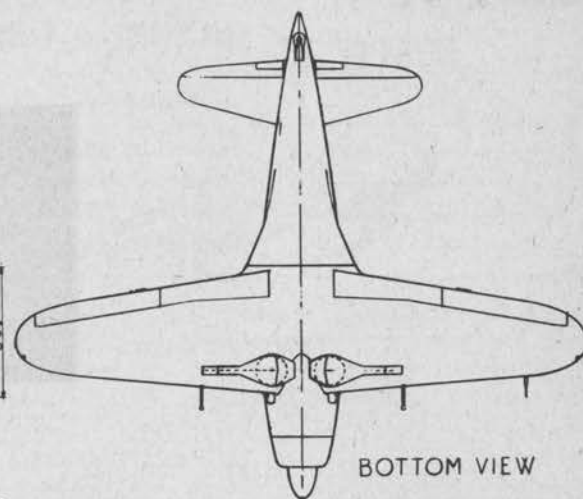
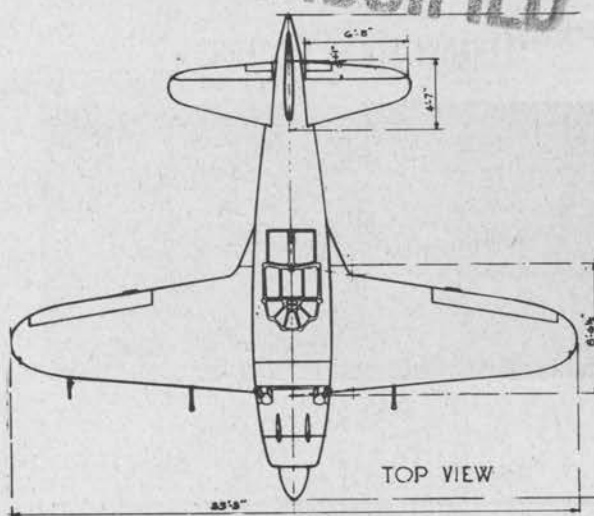
DATE December 1944

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JACK 11



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DATE December 1944

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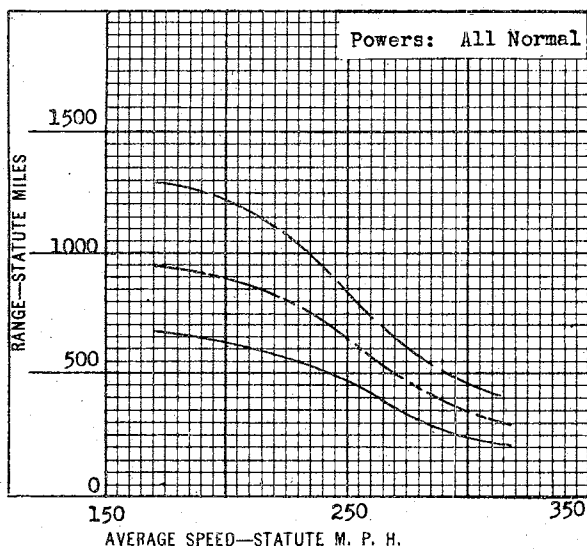
JACK 21

UNCLASSIFIED

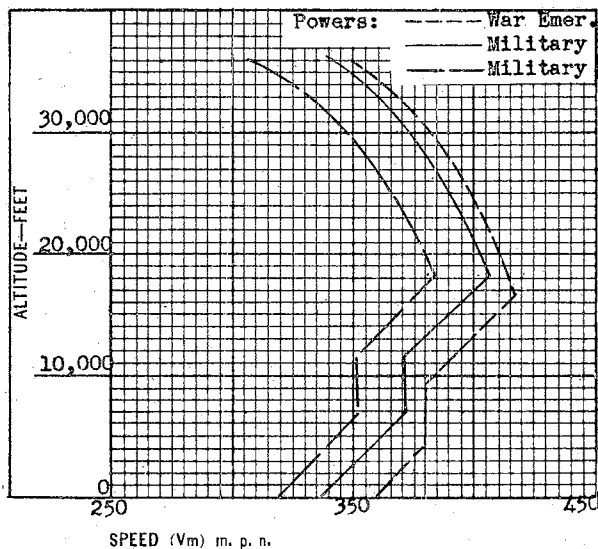
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	Normal Fighter	7320	660	None
-----	Overload Fighter	7734	951	"
-----	Overload Fighter	8130	1347	"
-----	Normal Fighter	7320	660	"

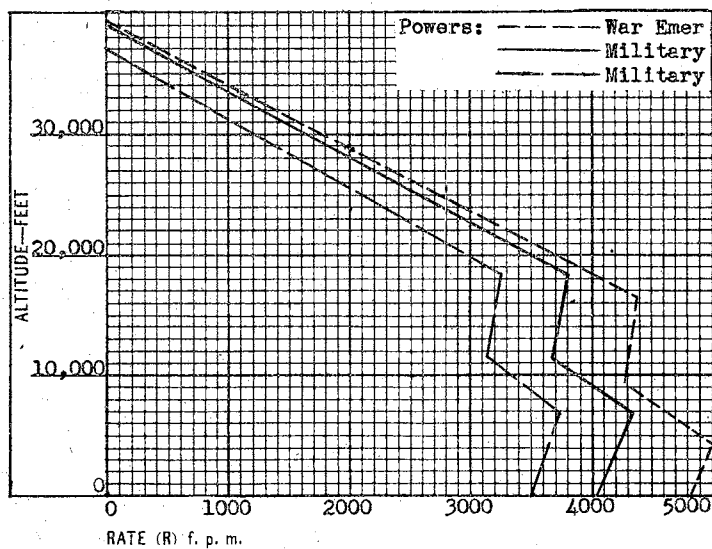
RANGE VS. SPEED



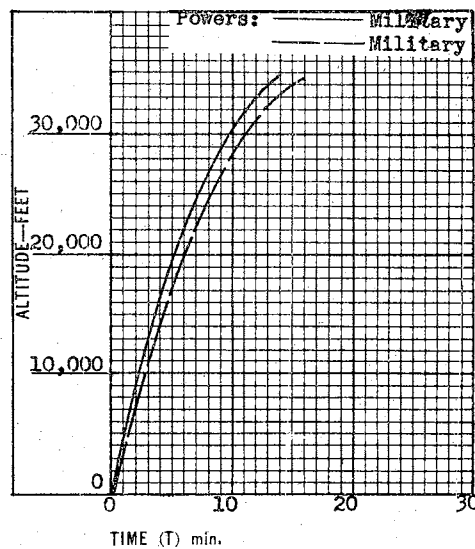
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE May 1945

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# UNCLASSIFIED

## PERFORMANCE AND CHARACTERISTICS

105B-2

### JACK 21

#### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	7320	1000
T. O. over 50' obstacle		
Landing over 50' obstacle		

#### CLIMB—CEILING

@ 7320 lbs.	Feet	Min.
Rate @ S. L.	4835	1
Rate @ 16,600 ft.	4380	1
Time to 10,000		2.3
Time to 20,000		5.1
Service ceiling 38,800		

#### AIRCRAFT

Duty Fighter (Interceptor)
Designation Raiden Model 21
Description Low wing monoplane
Mfg. Mitsubishi
Engines 1                      Crew 1
Construction All metal; semi-monocoque fuselage, cantilever wing

#### SPEED

@ 7320 lbs.	Mph.	Knts.	Altitude
Maximum	359	310	@ S. L.
Maximum	417	362	@ 16,600'
Cruising - Combat	318	275	@ 1500'
Economical - Cruising	171	147	@ 1500'

#### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	None		
Maximum	None		

#### ENGINES

	H. P.	Altitude
Take-off	1870	S.L.
Normal	1280	1500'
Military	1695	6800
	1560	18,100
War Emerg.	1940	4400
	1785	16,600

#### WEIGHTS

	Lbs.
Empty	
Gross	7320
Overload	8130

#### FUEL

	U. S. gal.	Imp. gal.
Built-in	159	132
Internal (Removable)		
External (drop)	66	55
Maximum	225	187

Mfg. Mitsubishi
Model Kasei 23
Type Radial
Cylinders 14                      Cooling Air (Fan Assist)
Supercharger 2 Speed
Propeller 4 Bl.C.S.      Diam. 10.825'
Fuel—Take-off 92      Cruising 92 plus ADI

#### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1300	1129	171	147	1500	225	187	None	None
Range @ Combat Cr	405	353	313	270	1500	225	187	None	None
Maximum range (normal fuel)	670	582	171	147	1500	110	92	None	None
Range @ Combat Cr Radius ( )	205	178	318	275	1500	110	92	None	None
Radius ( )									

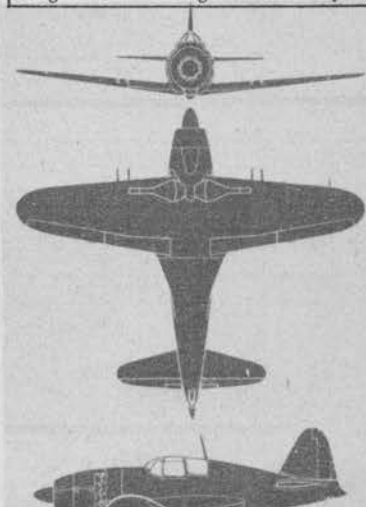
#### DIMENSIONS

Span 35.4'	Length 31.8'
Height 13'0"	Wing area 216 sq. ft.

#### GENERAL DATA

JACK is cleanly designed with a smoothly streamlined cowling which is made possible by the use of the long shafted Kasei 23 engine. It was designed primarily as an interceptor which accounts for the short range and high rate of climb. It may possibly carry a 35 kg. bomb under each wing for air to air bombing.

JACK 21 may be equipped with arrester hook.



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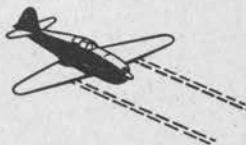
DATE May 1945

# UNCLASSIFIED

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## JACK 21

## FIELDS OF FIRE



FORWARD GUNS  
"A", AND "B"

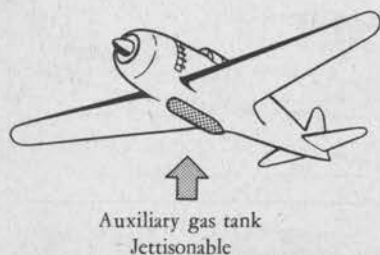
3/4-front view from above

## EXHAUST FLAME PATTERNS



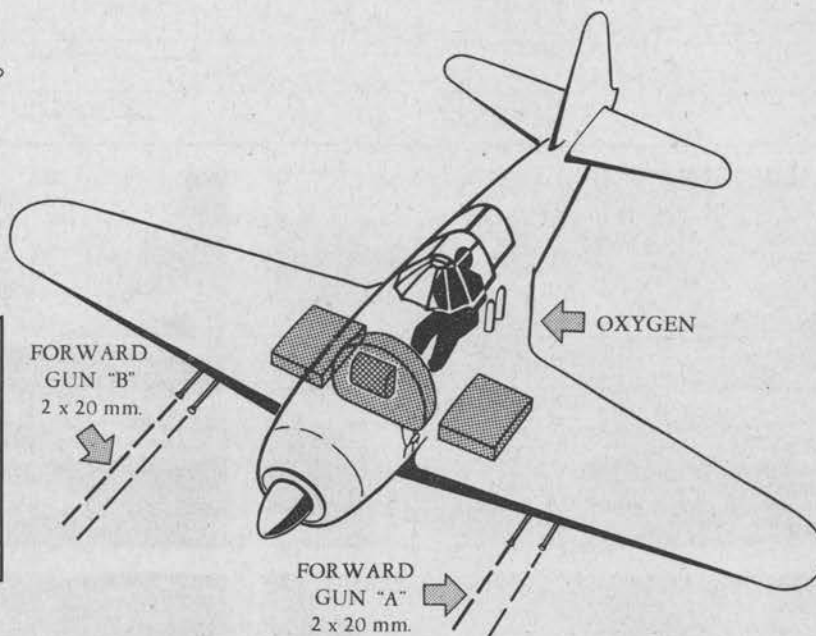
REAR VIEW

## VULNERABILITY



Auxiliary gas tank  
Jettisonable

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	



## ARMAMENT

	No.	Size	Rds. Gun	Type
Wing	4	20 mm	200	Type 99 Fixed, (Oerlikon), belt fed  One Mk.1 and one Mk.2 gun is mounted internally in each wing.

## TACTICAL DATA

No armor or fuel tank protection have been found or indicated by documents.

DATE May 1945

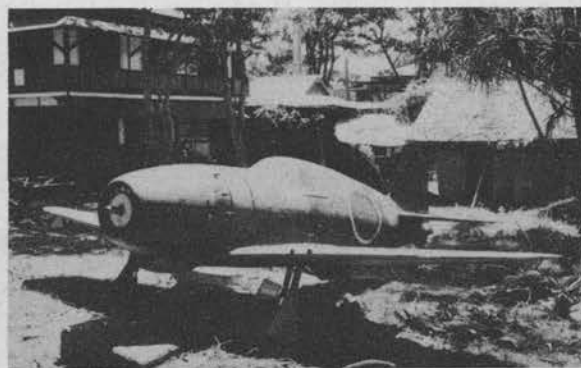
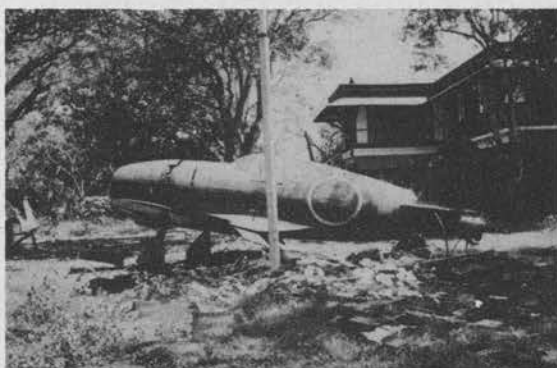
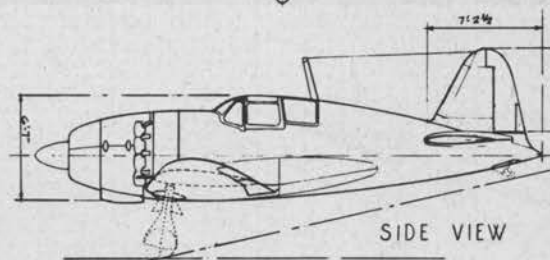
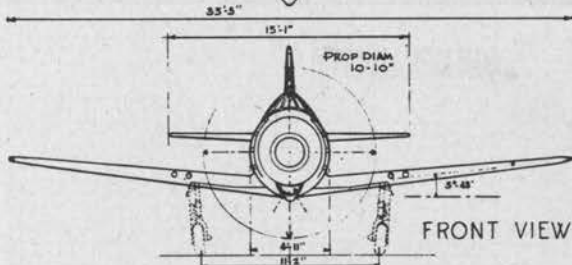
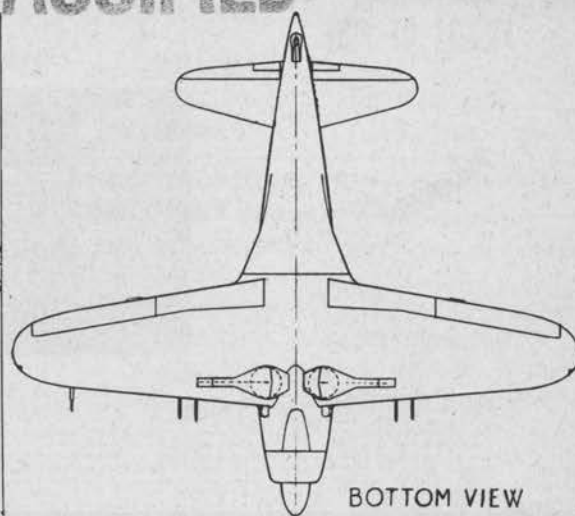
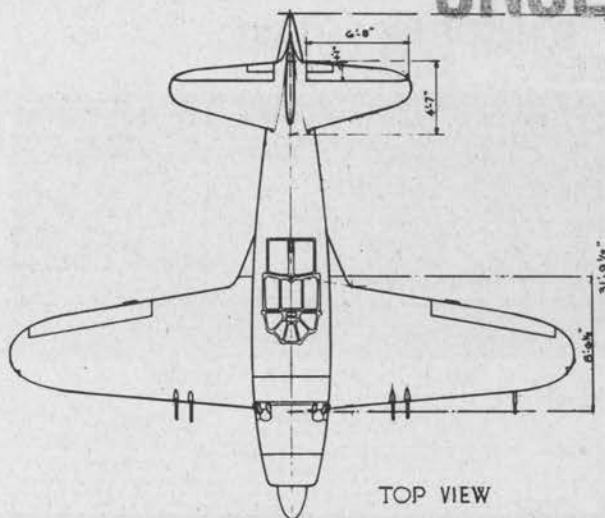
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JACK 21



RESTRICTED

DATE May 1945

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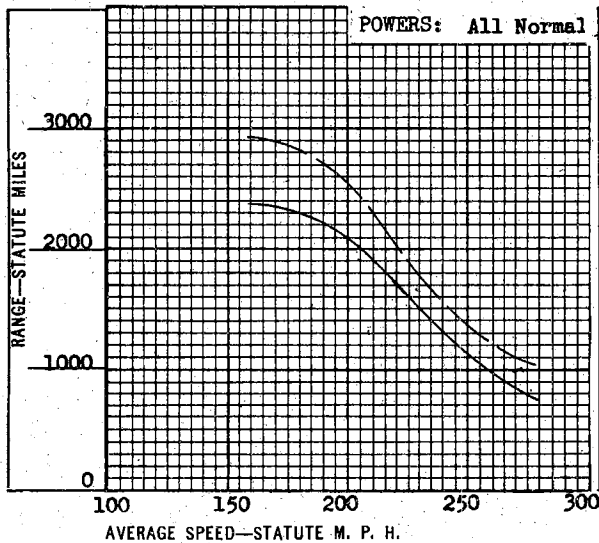
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## FRANCES 12(?)

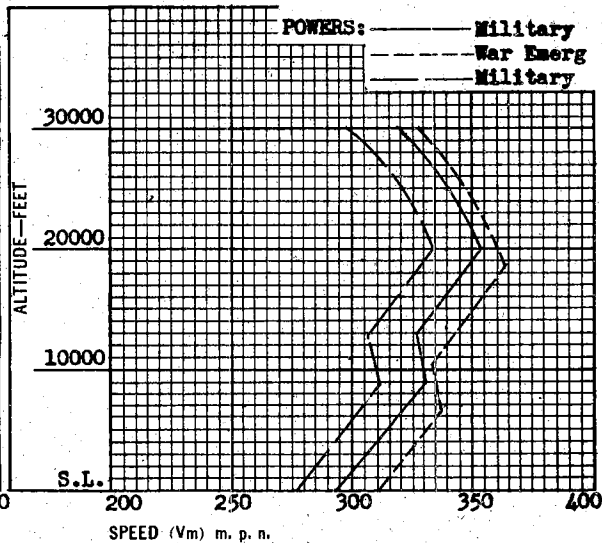
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
	NORMAL NIGHT FIGHTER	23940	5844	None
---	NORMAL NIGHT FIGHTER	23940	5844	None
---	NIGHT FIGHTER (Max. Fuel)	25835	7500	None

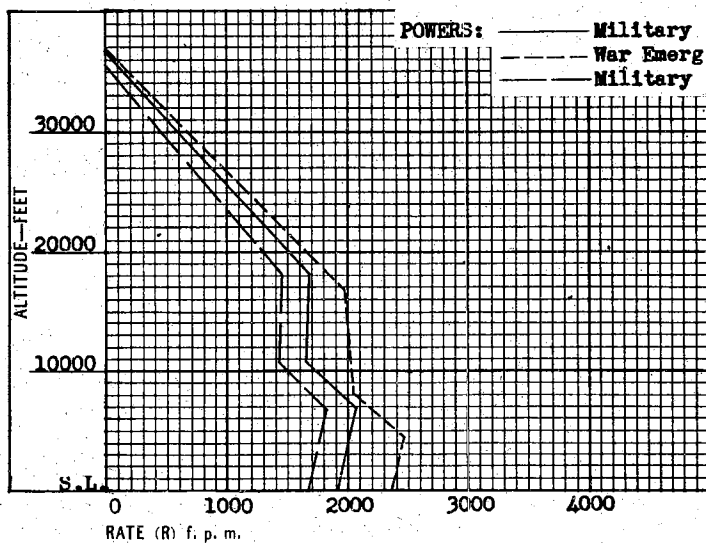
RANGE VS. SPEED



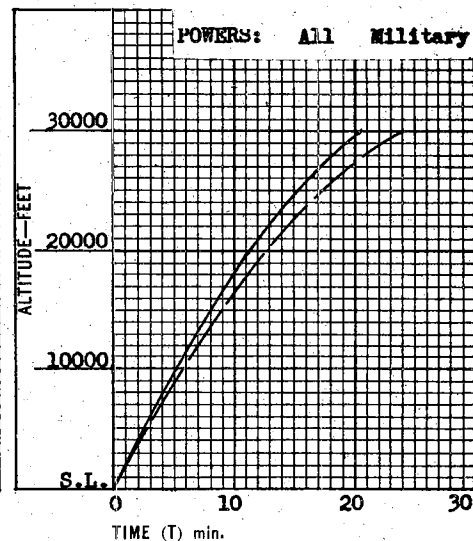
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE December 1944

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## PERFORMANCE

## AND

## CHARACTERISTICS

## FRANCES 12 ( ? )

## TAKE-OFF

	Load	Feet
T.O. calm	23,940	887
T.O. 25 kt. wind	23,940	422
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 23,940 lbs.	Feet	Min.
Rate @ S.L.	1910	1
Rate @ 6900 ft.	2065	1
Time to 10,000'		5.1
Time to 20,000'		11.2
Service ceiling 35,600'		

## AIRCRAFT

Duty Night Fighter
Designation (HAKKŌ) Model 12
Description Mid-wing Monoplane
Mfg. Nakajima
Engines 2 Crew 3
Construction All Metal

## SPEED

@ 23,940 lbs.	Mph.	Knts.	Altitude
Maximum	293	254	@ S. L.
Maximum	354	307	@ 20,050'
Cruising 75%	207	180	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum		None	

## ENGINES

	H. P.	Altitude
Take-off	1885	S.L.
Normal		
Military	1655	6,900'
	1520	18,050'
War Emerg.	1735	16,800'

## WEIGHTS

	Lbs.
Empty	17950
Gross	23940
Overload	25835

## FUEL

	U.S. gal.	Imp. gal.
Built-in	998	828
Internal (Removable)		
External (drop)	276	229
Maximum	*1274	1057

Mfg. Mitsubishi
Model KASEI 25
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 4 Blade Diam. 11.2'
C.S.
Fuel - Take-off 92 Cruising 92 plus methanol

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2925	2540	159	137	1500	1274	1057	None	None
At 75% Vmax.	2465	2140	205	178	1500	1274	1057	None	None
Maximum range (normal fuel)	2385	2071	159	137	1500	998	828	None	None
At 75% Vmax.	1980	1464	207	180	1500	998	828	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 65.6'	Length 49.2'
Height 17.4'	Wing area 592 sq.ft.

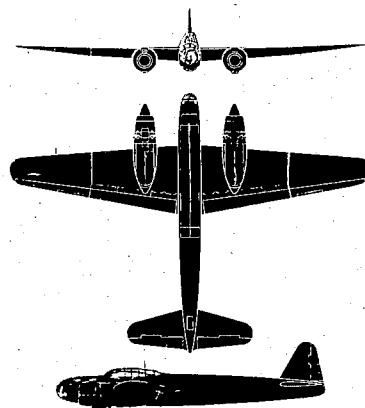
## GENERAL DATA

Except for engines and armament no substantial difference is noted between the bomber and night fighter versions of FRANCES. Radar is undoubtedly carried in the night fighter.

\*The fuselage tank of 306 gallons carried in FRANCES 11 has been eliminated in the calculations for FRANCES 12 (?) to allow room for additional night fighter equipment.

Silhouette shown is FRANCES 11.

DATE December 1944



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**FRANCES 12 ( ? )****UNCLASSIFIED**

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side						4	20 mm	100	?
Bottom						1	30 mm	42	?

**TACTICAL DATA**

Armor is provided for the pilot's back and head with a telescoping head piece.

Heavy armament is reported in the night fighter version but the location is unknown.

DATE December 1944

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FRANCES 12( ? )

Drawing

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Photos

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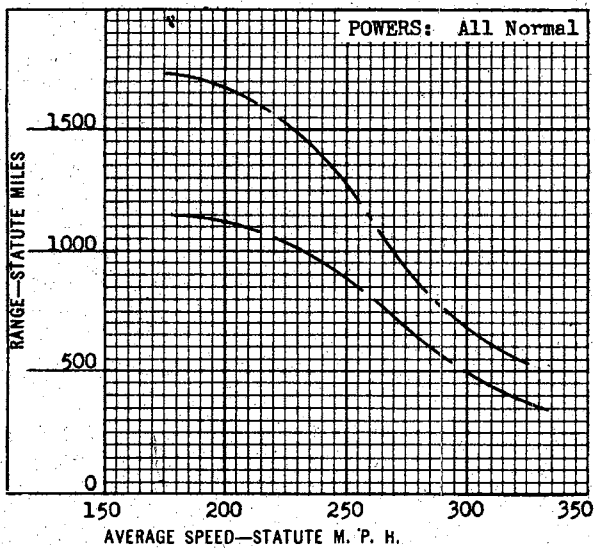
DATE December 1944

# GEORGE 11

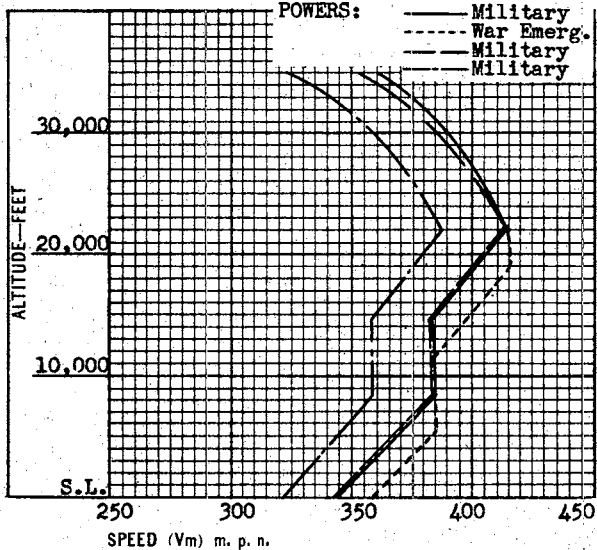
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	INTERCEPTOR FIGHTER	8380	582	None
-----	INTERCEPTOR FIGHTER	8380	582	None
————	NORMAL FIGHTER	9018	1116	None
-----	OVERLOAD FIGHTER	9740	1752	None

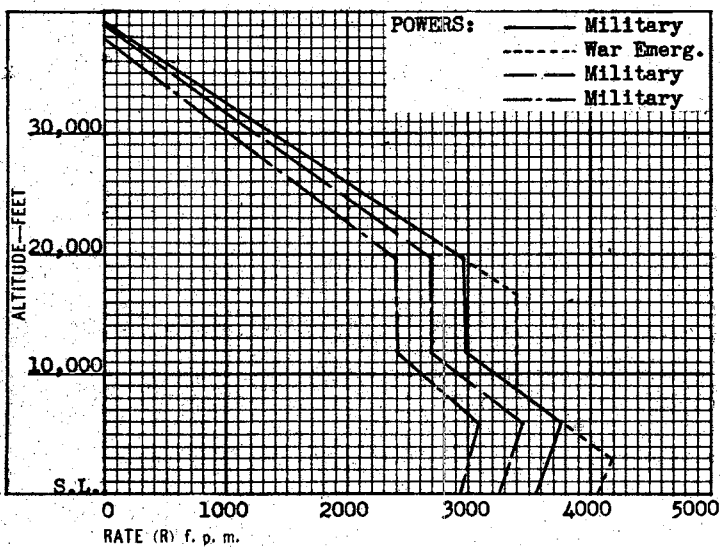
RANGE VS. SPEED



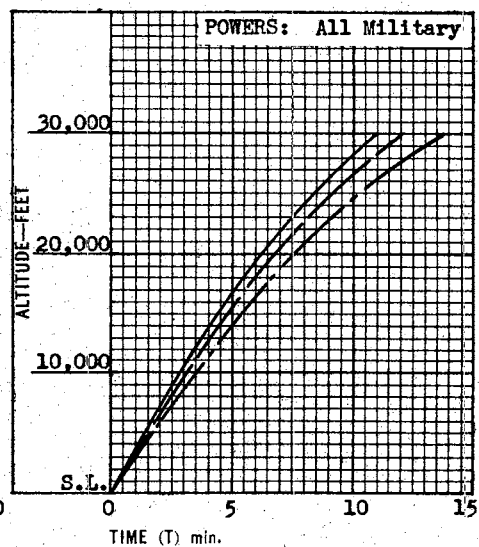
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



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## PERFORMANCE AND CHARACTERISTICS

GEORGE 11

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	9018	1125
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 8380 lbs.	Feet	Min.
Rate @ S. L.	4070	1
Rate @ 19,600 ft.	3400	1
Time to 10,000'		2.8
Time to 20,000'		6.1
Service ceiling	35,100'	

## AIRCRAFT

Duty Interceptor Fighter
Designation Shiden Model 11 N1K1-J
Description Low-wing monoplane
Mfg. Kawanishi
Engines 1 Crew 1
Construction All metal; semi-monocoque fuselage, cantilever wing.

## SPEED

@ 8380 lbs.	Mph.	Knts.	Altitude
Maximum	358	311	@ S. L.
Maximum @ 9018 lbs.	416	361	@ 19,000'
Cruising - Combat	333	289	@ 1500'
Economical - Cruising	178	150	@ 1500'

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum	2	60 kg	265

## ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
Normal	1540	1500'
Military	1875	5900'
	1675	19,600'
War Emerg.	2040	3000'
	1830	16,600'

## WEIGHTS

	Lbs.
Empty	6360
Interceptor Fighter	8380
Gross	9018
Overload (Fuel)	9730

## FUEL

	U. S. gal.	Imp. gal.
Built-in	186	155
Internal (Removable)		
External (drop)	106	88
Maximum	292	243

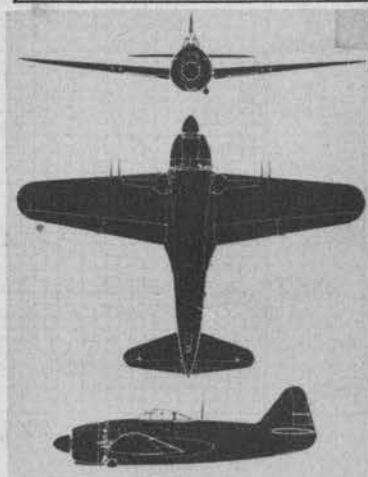
Mfg. Nakajima
Model Homare 21
Type Radial
Cylinders 18 Cooling Air
Supercharger 2 Speed
Propeller 4 Bl.C.S. Diam. 10.825'
Fuel—Take-off 92 Cruising 92 plus methanol

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1730	1505	176	152	1500	292	243	None	
Range @ Combat Cr.	535	465	325	282	1500	292	243	None	
Maximum range (normal fuel)	1150	1000	178	150	1500	186	155	None	
Range @ Combat Cr.	350	305	333	289	1500	186	155	None	
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 39.4'	Length 29.5'
Height 13.3'	Wing area 253 sq. ft.



## GENERAL DATA

The performance of GEORGE 11 carrying 2 x 60 kg. bombs will be slightly better than the "overload" with the exception of range, which will be somewhat shorter than normal fighter range.

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DATE May 1946

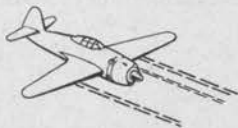
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## GEORGE 11

## FIELDS OF FIRE

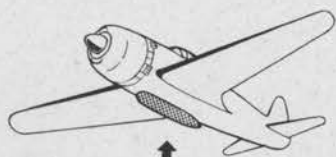


FORWARD GUNS  
"A", "B" & "C"  
3/4-front view from above

## EXHAUST FLAME PATTERNS

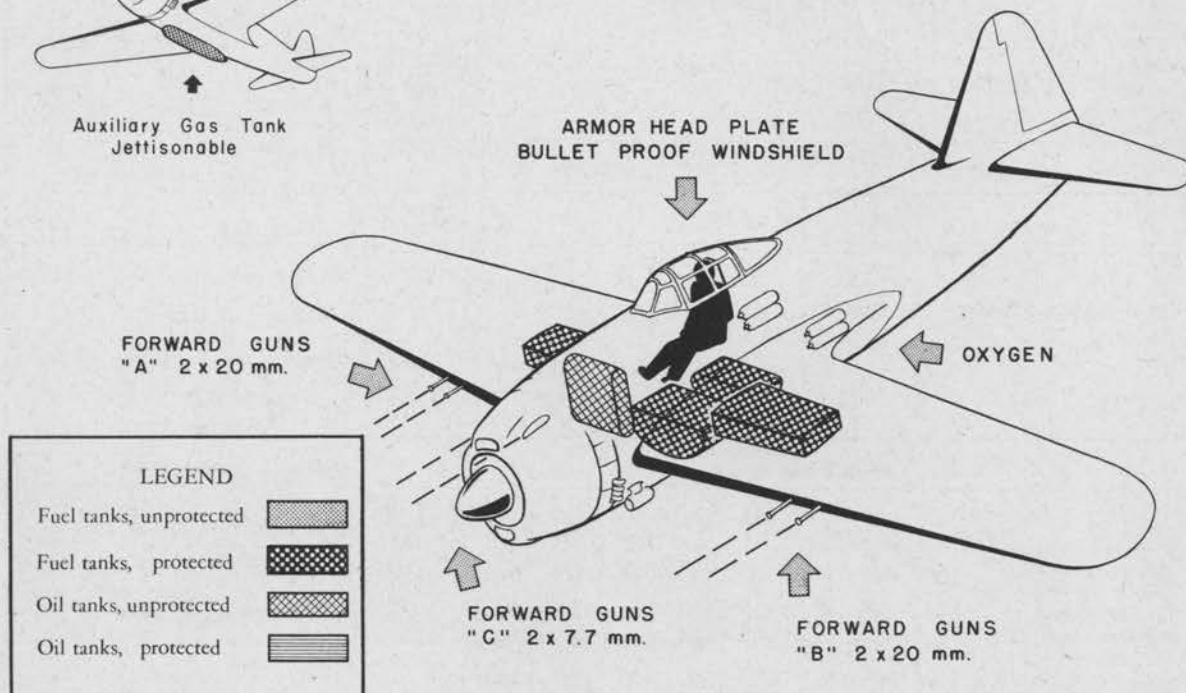


REAR VIEW



Auxiliary Gas Tank  
Jettisonable

## VULNERABILITY



## LEGEND

- Fuel tanks, unprotected
- Fuel tanks, protected
- Oil tanks, unprotected
- Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	2	7.7mm	500	Type 97 Fixed, (Vickers), synchronized
Wing	4	20 mm	100	Type 99 Mk.1 or Mk.2 Fixed (Oerlikon) magazine fed
or	4	20 mm	220	Type 99 Mk.1 or Mk.2 Fixed (Oerlikon) belt fed

## TACTICAL DATA

The inboard magazine fed 20mm guns may be mounted in fairings under the wings.

13 mm Type 3 guns are expected to replace the 7.7 mm guns in later models.

DATE May 1945

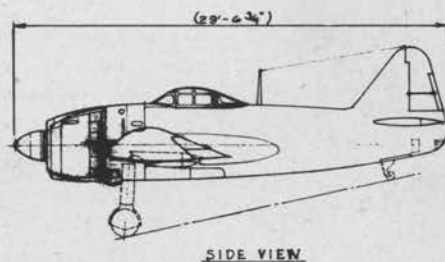
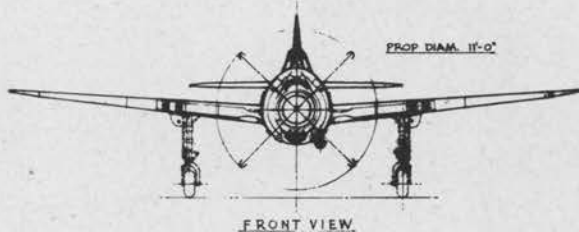
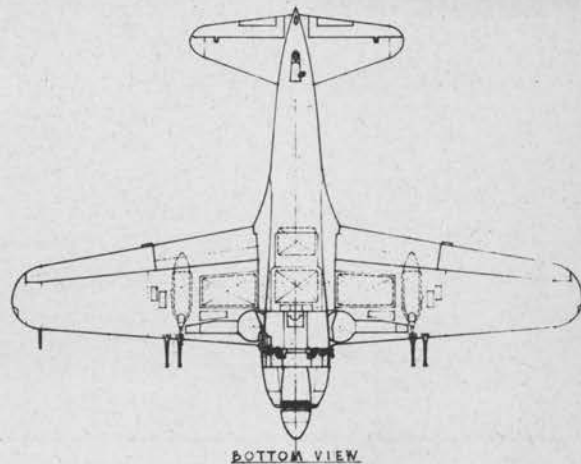
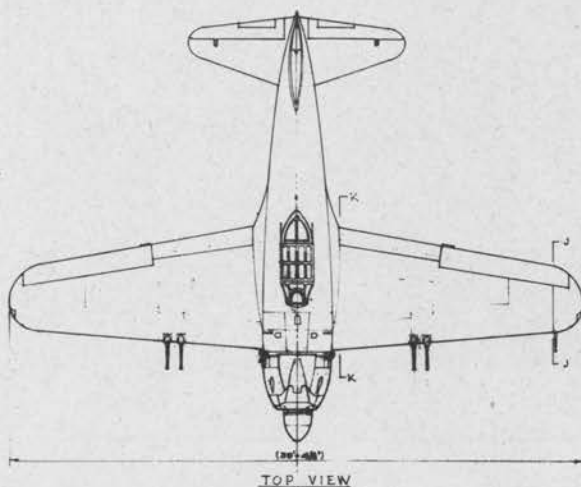
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## GEORGE 11



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DATE May 1945

**SAM 11****UNCLASSIFIED**

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	20 mm	120	Fixed	Tail				
Top	2	13 mm	300	Fixed	Wing				
Side									
Bottom									

**TACTICAL DATA**

No information

DATE December 1944

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## PERFORMANCE AND CHARACTERISTICS

SAM 11

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to 19,686'			6
Time to			
Service ceiling 40,000'			

## AIRCRAFT

Duty Fighter, Carrier-borne
Designation (REPPU) Model 11
Description
Mfg. Mitsubishi
Engines 1 Crew 1
Construction All Metal (?)

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum	395	343		@ 19,686'
Cruising 75%	288	250		1,500'
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	2	60 kg	264
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
Normal		
Military	1900	6,560'
War Emerg.	1700	19,686'

## WEIGHTS

	Lbs.
Empty	5645
Gross	8380
Overload	9260

## FUEL

	U.S. gal.	Imp. gal.
Built-in	265	
Internal (Removable)		
External (drop)	132	
Maximum	397	

Mfg. Nakajima
Model Homare 41
Type Radial
Cylinders 18 Cooling Air
Supercharger 2 Stage
Propeller 4 Blade Diam.
Fuel - Take-off C.S. Cruising

## RANGE AND RANGE

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1440	1250				397		None	None
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 36.1'	Length 29.5'
Height	Wing area sq.ft.

## GENERAL DATA

SAM 11, 17 Experimental Carrier-borne fighter, is a relatively long range, general purpose carrier fighter apparently designed as the successor to the ZEKE models.

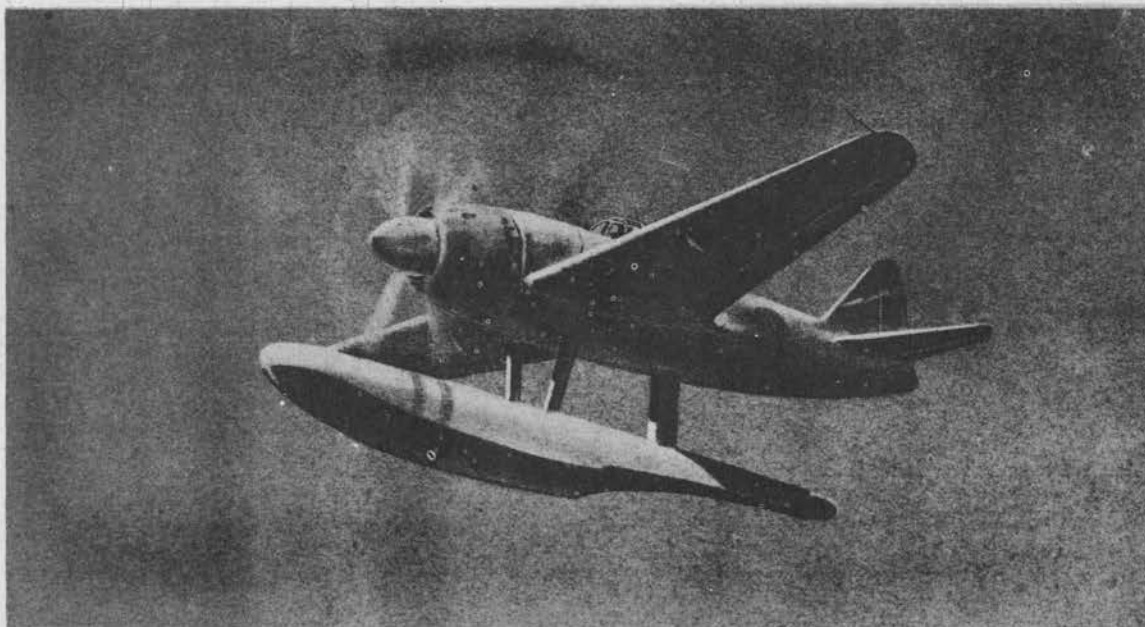
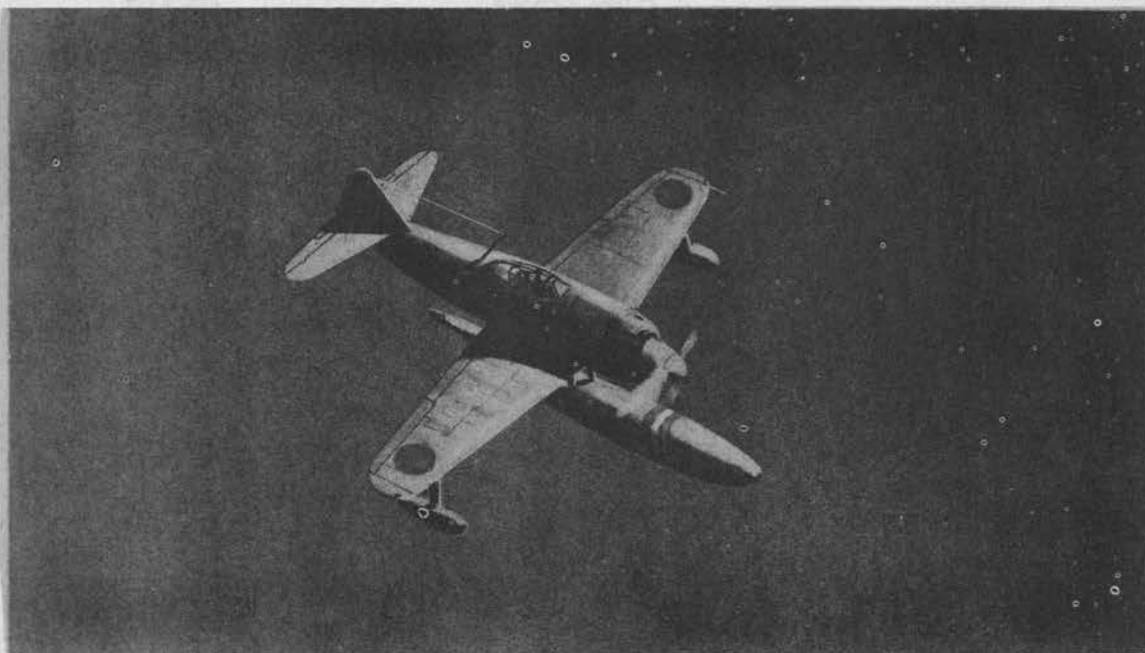
Little is known of SAM, and performance, therefore, is necessarily incomplete.

Provisional Data

DATE December 1944

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## ARMAMENT

	No.	Size	Rds. Gun	Type
Cowl	2	7.7mm	500	Type 97 Fixed, Vickers type.
Wings	2	20mm	60	Type 99 Mk 1 Mod 3 Fixed, Oerlikon type.

## TACTICAL DATA

13.2mm Type 3 fixed guns  
may replace the present cowl  
guns.

DATE June 1945

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## PERFORMANCE

AND

## CHARACTERISTICS

REX 11

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@	7,700 lbs.	Feet	Min.
Rate @ S.L.			
Rate @		ft.	
Time to 19,700'			6.3
Time to 16,400'			5.5
Service ceiling			

## AIRCRAFT

Duty	Fighter
Designation	KYOFU Model 11
Description	Mid-wing Single-float plane
Mfg.	Kawanishi
Engines	1
Crew	1
Construction	All Metal

## SPEED

@ 7,700 lbs.	Mph.	Knts.	Altitude
Maximum			@ S. L.
Maximum	302	262	@ 19,700'
Cruising			
Economical			

## BOMBS-CARGO

	No.	Size	Total Lbs.
Maximum	2 x 30 kg		132
or	2 x 60 kg		264

## ENGINES

	H. P.	Altitude
Take-off	1825	S.L.
Normal		
Military	1655	6,900'
War Emerg.	1520	18,700

## WEIGHTS

	Lbs.
Empty	6060
Gross	7700
Overload	8160

## FUEL

	U.S. gal.	Imp. gal.
Built-in	216	180
Internal (Removable)		
External (drop)		
Maximum	216	180

Mfg.	Mitsubishi
Model	Kasei 24
Type	Radial
Cylinders	14
Cooling	Air
Supercharger	2 Speed
Propeller	3 Bl. OS Diam. 9.8'
Fuel - Take-off	92
Cruising	92
Plus ADI	

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1170	1020	230	200					
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	39.37'	Length	33.4'
Height	14'	Wing area	263 sq.ft.

## GENERAL DATA

The above information is based on fragmentary documentary information and is to be regarded as highly provisional. As more information is received, further data will be issued.

GEORGE 11 is reported to be a modification of REX.

PROVISIONAL DATA

DATE June 1945



UNCLASSIFIED

110A-1

**LUKE 11** UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	1	30 mm	100	Fixed	Tail				
Top	2	20 mm	200	Fixed	Wing				
Side									
Bottom									

**TACTICAL DATA**

No information
----------------

DATE December 1944

ED



# UNCLASSIFIED

## PERFORMANCE AND CHARACTERISTICS

# LUKE 11

### TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB-CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to 26,250'			9.7
Time to			
Service ceiling			

### AIRCRAFT

Duty Interceptor Fighter
Designation (JINRAI) Model 11
Description Twin fuselage mono-plane
Mfg. Mitsubishi
Engines 1 Crew 1
Construction

### SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum	437	380		@ 26,250'
Cruising				
Economical				

### BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	2	x 60 kg	264
Maximum			

### ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
Normal		
Military	1660	6,500'
	1380	27,500'
War Emerg.	1740	27,900'

### WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

### FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

Mfg.
Model Mk 9D (Ha 43, Model 41)
Type Radial
Cylinders 18 Cooling Air
Supercharger 2 Stage
Propeller Pusher Diam.
Fuel - Take-off 92 Cruising 92 plus methanol

### RANGE AND RADIIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)	575	500	288	250					
Radius ( )									
Radius ( )									

### DIMENSIONS

Span	Length
Height	Wing area sq.ft.

### GENERAL DATA

LUKE 11 is derived from 17 Experimental interceptor fighter manufactured by Mitsubishi. Described as a single-engine, twin-boom pusher type, LUKE is believed to have very high speed but short range. This plane may be used for air to air bombing.

Provisional Data

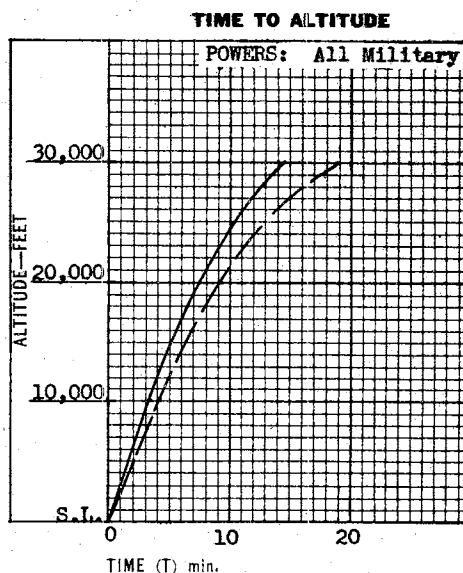
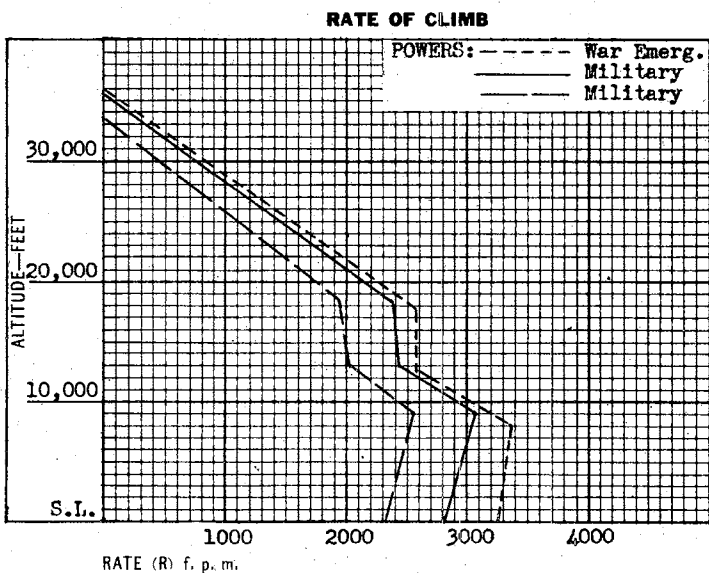
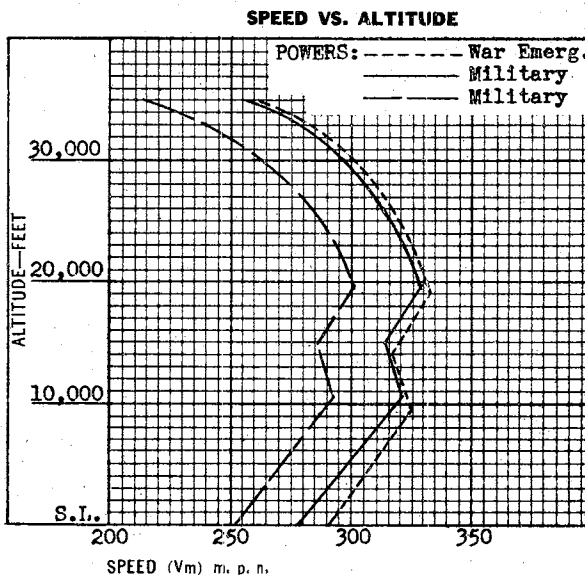
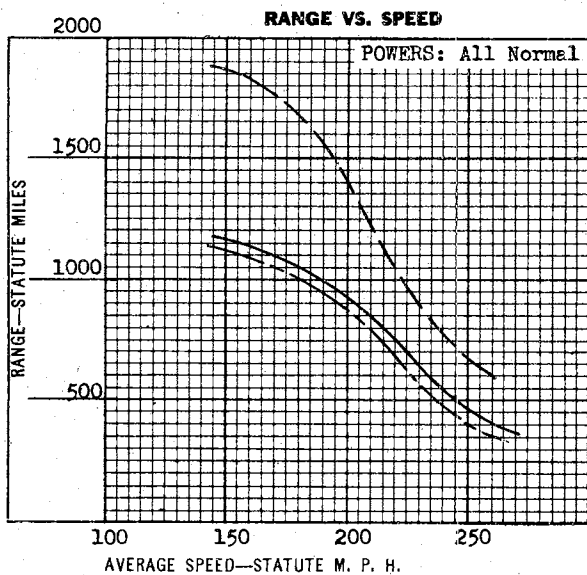
DATE December 1944

# UNCLASSIFIED

OSCAR 2

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	NORMAL FIGHTER	5500	894	None
=====	NORMAL FIGHTER	5500	894	None
-----	OVERLOAD FIGHTER	6240	1442	None
-----	OVERLOAD FIGHTER	5940	894	440



DATE May 1945

UNCLASSIFIED

# UNCLASSIFIED

## PERFORMANCE AND CHARACTERISTICS

152A-2

## OSCAR 2

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	5500	896
T. O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 5500 lbs.	Feet	Min.
Rate @ S. L.	3250	1
Rate @ ft.	2570	1
Time to 10,000'		3.4
Time to 20,000'		7.5
Service ceiling 35,900'		

### AIRCRAFT

Duty Fighter
Designation Type 1, K1 43
Description Low-wing monoplane
Mfg. Nakajima
Engines 1 Crew 1
Construction All Metal; semi-monocque fuselage, cantilever wing.

### SPEED

@ 5500 lbs.	Mph.	Knts.	Altitude
Maximum	291	252	@ S. L.
Maximum	333	289	@ 19,100'
Cruising - Combat	271	235	@ 1500'
Economical - Cruising	145	126	@ 1500'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum	2	100 kg	440

### ENGINES

	H. P.	Altitude
Take-off	1065	S.L.
Normal	840	1500'
Military	1055	9200'
	925	17,700'
War Emerg.	1150	8000'
	990	18,350'

### WEIGHTS

	Lbs.
Empty	4170
Gross	5500
Overload	6240

### FUEL

	U. S. gal.	Imp. gal.
Built-in	149	123
Internal (Removable)		
External (drop)	108	90
Maximum	257	213

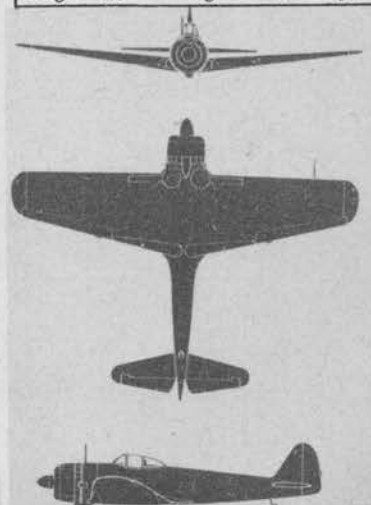
Mfg. Nakajima
Model Type 2 - 1150 hp
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 Bl. C.S. Diam. 9.2'
Fuel-Take-off Cruising

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1885	1635	143	124	1500	257	213	None	None
Range @ Combat Cr	595	520	261	227	1500	257	213	None	None
Maximum range (normal fuel)	1175	1020	145	126	1500	149	123	None	None
Range @ Combat Cr Radius (	360	310	271	235	1500	149	123	None	None
Max. Range - Bomb Radius (	1125	980	143	124	1500	149	123	440	None

### DIMENSIONS

Span 35.6'	Length 29.2'
Height 11.7'	Wing area 231 sq. ft.



### GENERAL DATA

A captured handbook states that the maximum radius is 560 miles after allowances for take-off and 20 minutes of combat. It further states that diving speed is to be limited to 370-400 mph.

RESTRICTED

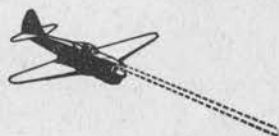
DATE May 1945

UNCLASSIFIED

OSCAR 2

UNCLASSIFIED

FIELDS OF FIRE

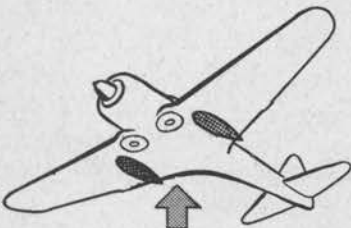


FORWARD GUNS "A"  
¾-front view from above

EXHAUST FLAME PATTERNS

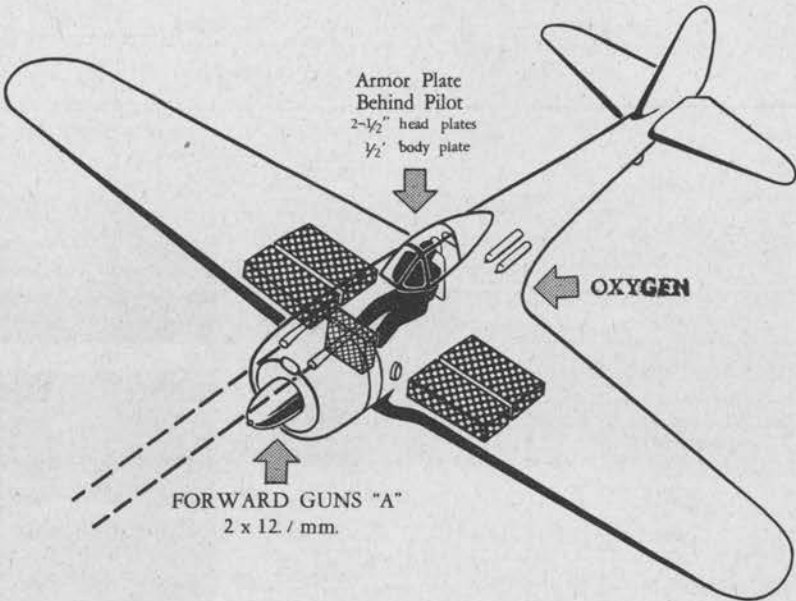


REAR VIEW



Auxiliary gas tanks  
Jettisonable

VULNERABILITY



LEGEND

Fuel tanks, unprotected	[Pattern]
Fuel tanks, protected	[Pattern]
Oil tanks, unprotected	[Pattern]
Oil tanks, protected	[Pattern]

ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	2	12.7mm	250	Type 1 Fixed, (Browning), synchronized

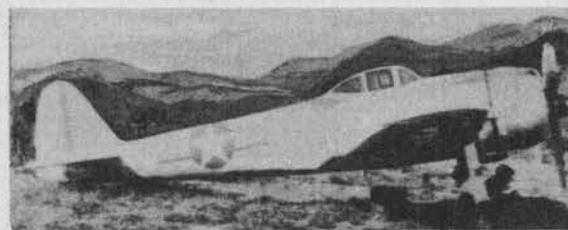
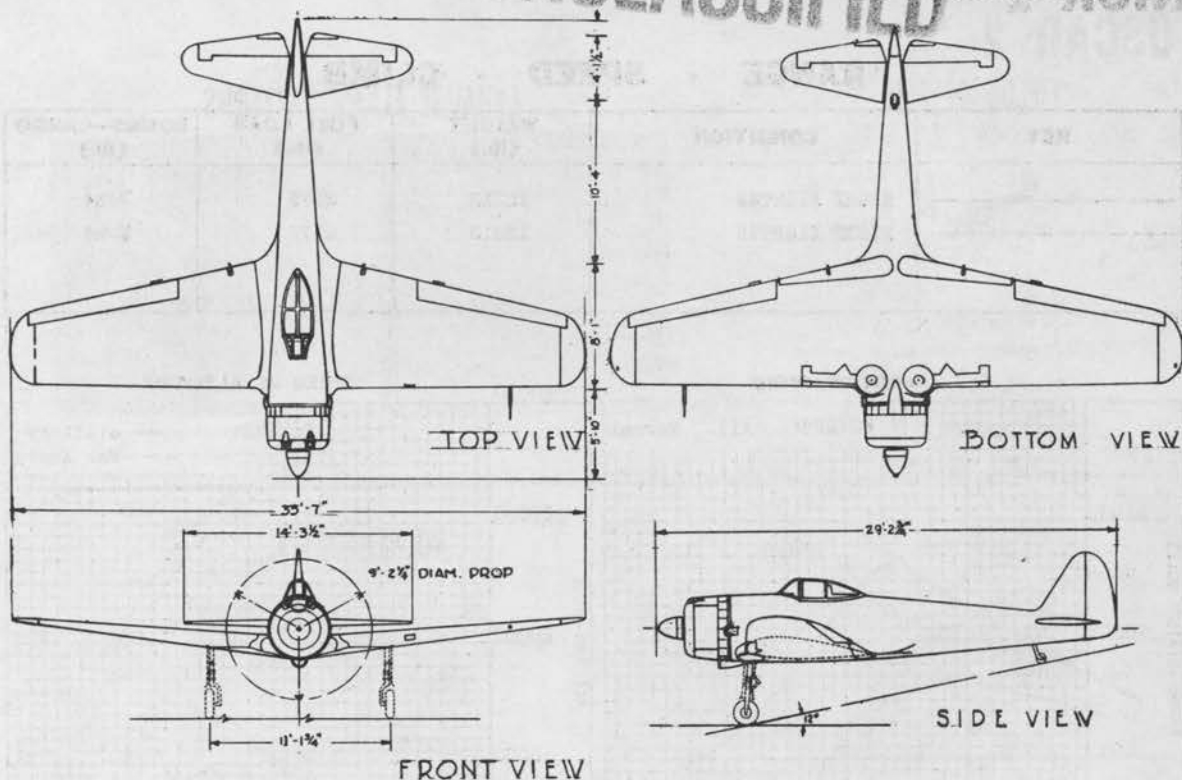
TACTICAL DATA

12 mm armor plate behind pilot. Fuel tanks covered by leak proofing material.

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UNCLASSIFIED OSCAR 2



RESTRICTED

DATE December 1944

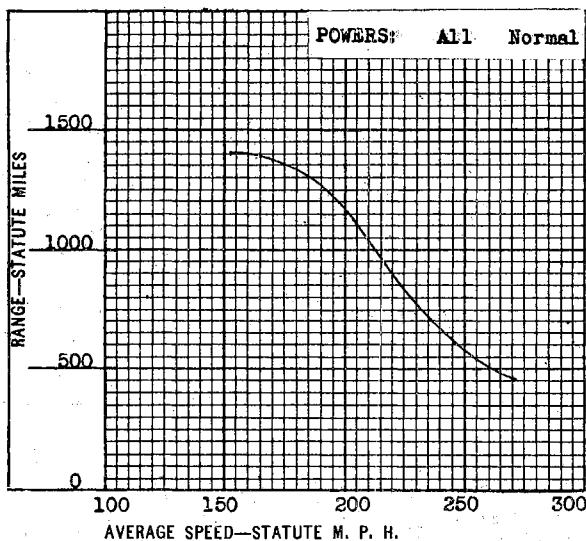
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NICK 1

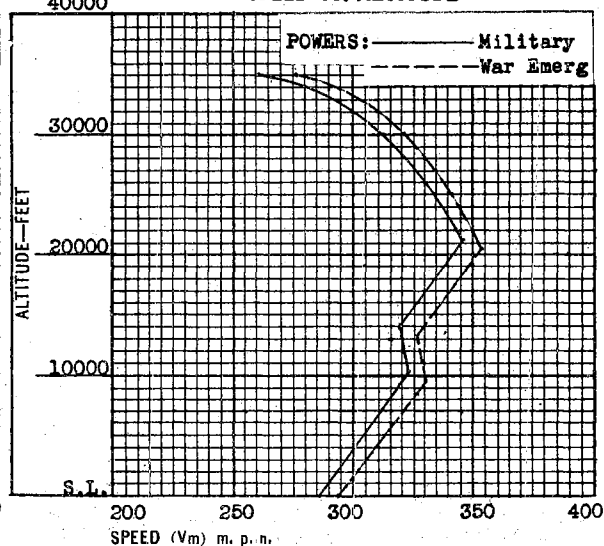
# **RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NIGHT FIGHTER	12213	2178	None
-----	NIGHT FIGHTER	12213	2178	None

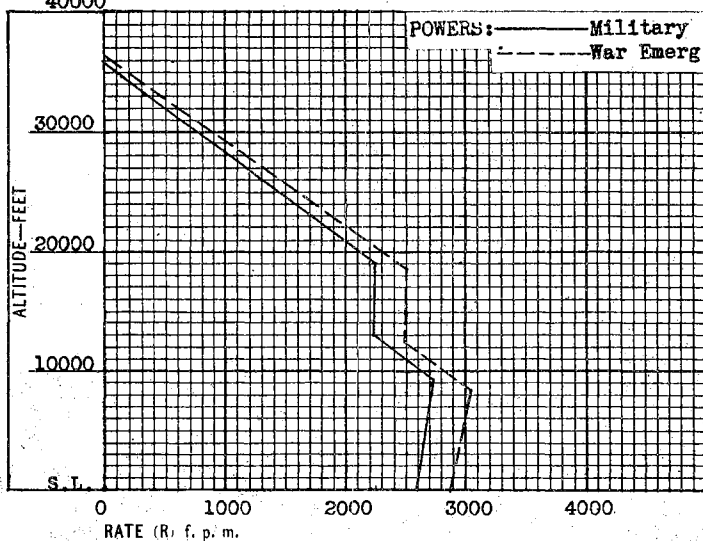
RANGE VS. SPEED



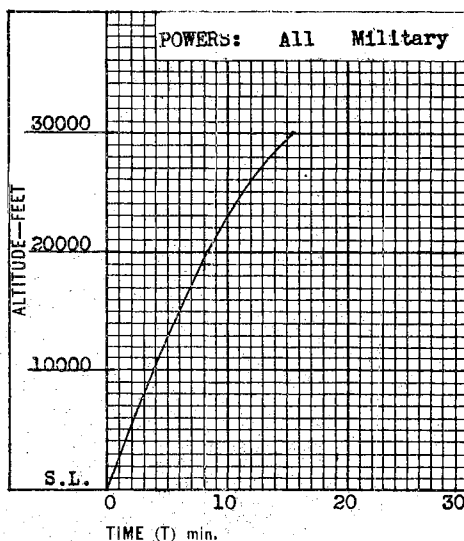
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE





# UNCLASSIFIED

## PERFORMANCE AND CHARACTERISTICS

152B-2

## OSCAR 3

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	5650	890
T. O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 5650 lbs.	Feet	Min.
Rate @ S. L.	3430	1
Rate @ 20,400 ft.	2620	1
Time to 10,000'		3.4
Time to 20,000'		7.4
Service ceiling 37,400'		

### AIRCRAFT

Duty	Fighter
Designation	Type 1 Model 3
Description	Low-wing monoplane
Mfg.	Tachikawa
Engines	1
Crew	1
Construction	All metal

### SPEED

@ 5650 lbs.	Mph.	Knts.	Altitude
Maximum	303	263	@ S. L.
Maximum	358	311	@ 21,900'
Cruising - Combat	275	239	@ 1500'
Economical - Cruising	146	127	@ 1500'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	2	50 kg	221
Maximum	2	100 kg	441

### ENGINES

	H. P.	Altitude
Take-off	1150	S.L.
Normal	835	1500'
Military	1085	9300'
	950	21,700'
War Emerg.	1210	8000'
	1055	20,400'

### WEIGHTS

	Lbs.
Empty	4210
Gross	5650
Overload (Fuel)	6390
Overload (Bombs)	6040

### FUEL

	U. S. gal.	Imp. gal.
Built-in	170	143
Internal (Removable)		
External (drop)	108	90
Maximum	278	233

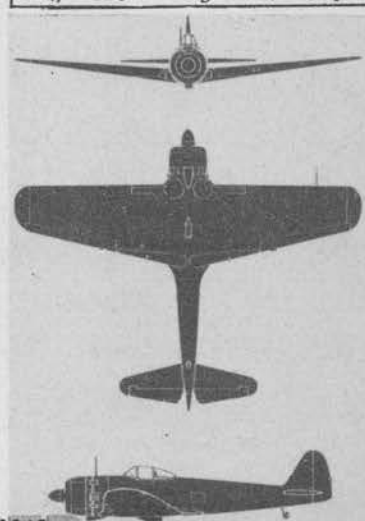
Mfg.	Nakajima
Model	Ha 115 Model 2
Type	Radial
Cylinders	14
Cooling	Air
Supercharger	2 Speed
Propeller	3 Bl. C.S. diam. 9.185'
Fuel-Take-off	92
Cruising	92

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1995	1735	145	126	1500	278	233	None	
Range @ Combat Cr	625	545	266	231	1500	278	233	None	
Maximum range (normal fuel)	1305	1135	147	128	1500	170	143	None	
Range @ Combat Cr Radius ( )	395	345	275	239	1500	170	143	None	
Max. Range (Bomb) Radius ( )	1245	1080	145	126	1500	170	143	441	

### DIMENSIONS

Span	35.6'	Length	29.2'
Height	11.7'	Wing area	230.5 sq. ft.



### GENERAL DATA

OSCAR 3 has somewhat improved performance over OSCAR 2 and is fitted with a more powerful engine, ejector exhaust stacks, and an additional fuel tank located in the fuselage, directly aft of the pilot.

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DATE May 1945

# UNCLASSIFIED

OSCAR 3

UNCLASSIFIED

FIELDS OF FIRE

EXHAUST FLAME PATTERNS

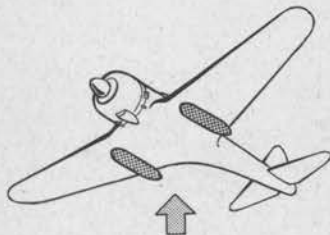


FORWARD GUNS "A"  
3/4-front view from above

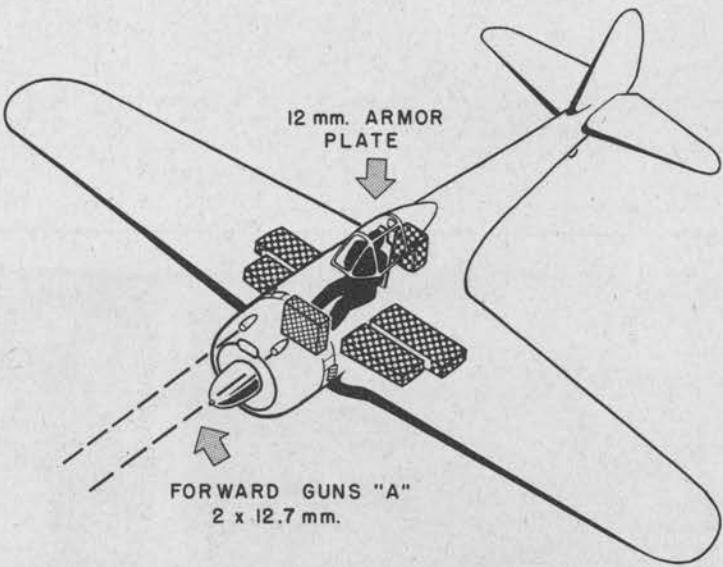


REAR VIEW

VULNERABILITY



Auxiliary Gas Tanks  
Jettisonable



12 mm. ARMOR  
PLATE

FORWARD GUNS "A"  
2 x 12.7 mm.

LEGEND

- Fuel tanks, unprotected
- Fuel tanks, protected
- Oil tanks, unprotected
- Oil tanks, protected

ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	2	12.7mm	250?	Type 1 Fixed, (Browning), synchronized

TACTICAL DATA

12 mm armor plate behind pilot.

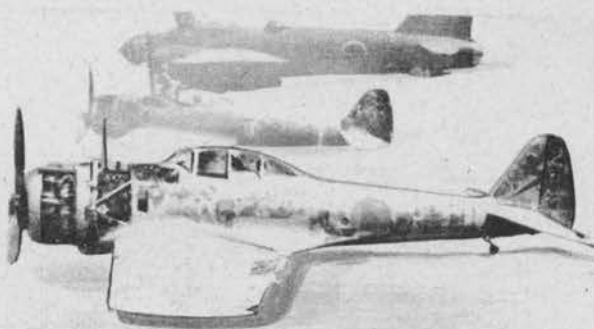
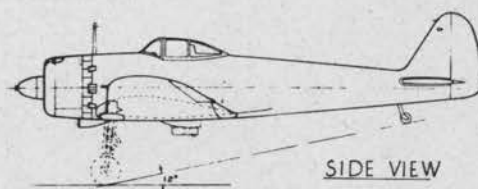
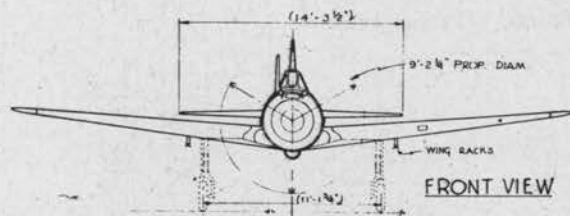
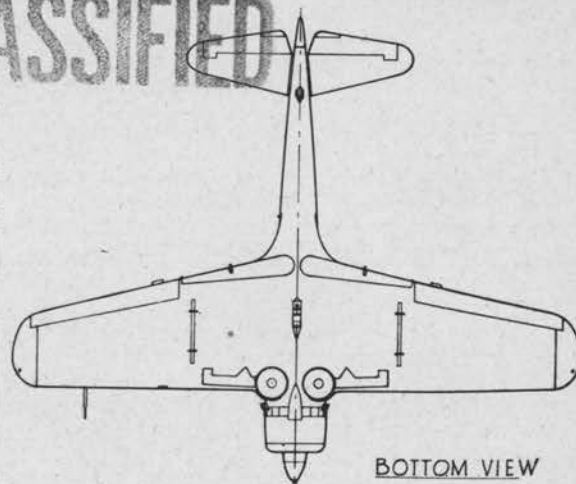
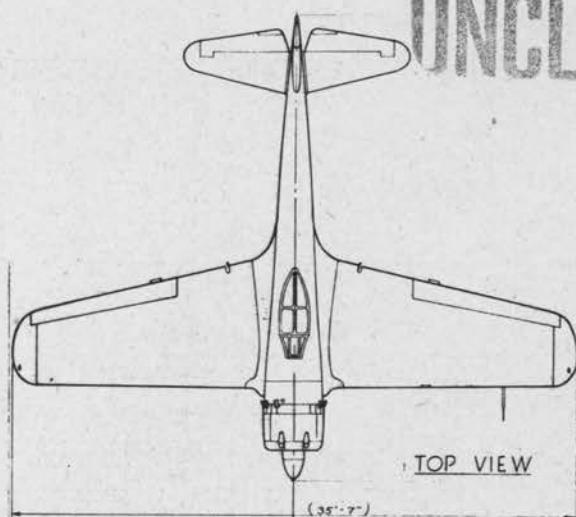
DATE May 1945

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## OSCAR 3

UNCLASSIFIED



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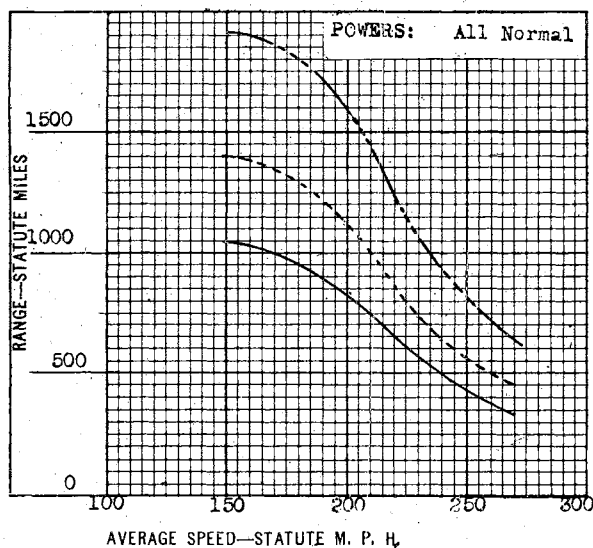
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DATE May 1916

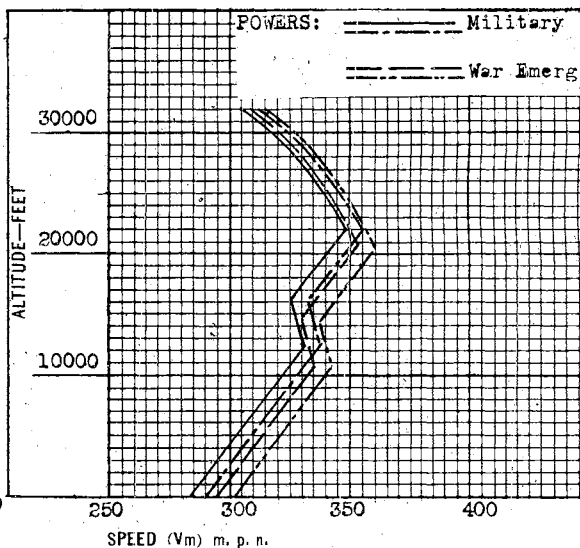
# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NIGHT FIGHTER (Normal)	11,685	1567	
-----	NIGHT FIGHTER (Normal)	11,685	1567	
-----	NIGHT FIGHTER (Overload)	12,349	2171	
-----	DAY FIGHTER (Normal)	11,911	2258	
-----	DAY FIGHTER (Normal)	11,911	2258	
-----	DAY FIGHTER (Overload)	12,575	2862	

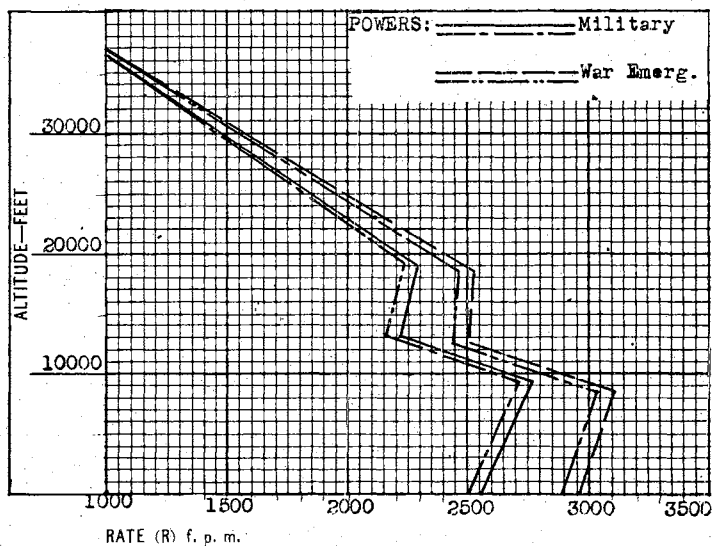
## RANGE VS. SPEED



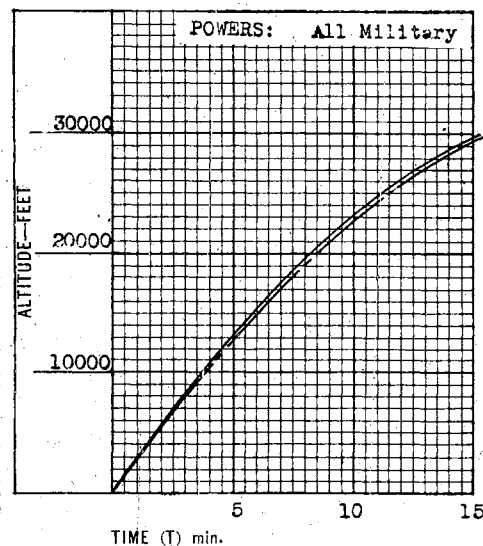
## SPEED VS. ALTITUDE



## RATE OF CLIMB



## TIME TO ALTITUDE



UNCLASSIFIED

153A-2

## PERFORMANCE AND CHARACTERISTICS

NICK 1

## TAKE-OFF

	Load	Feet
Runway Requirements	11,685	1160
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@	11,911 lbs.	Feet	Min.
Rate @ S.L.		2892	1
Rate @ 18,500 ft.		2471	1
Time to 9,200'			3.53
Time to 19,000'			7.81
Service ceiling		35,800'	

## AIRCRAFT

Duty Fighter, Night Fighter

Designation Type 2 (K1 45)

Description Low mid-wing  
Monoplane

Mfg. Kawasaki

Engines 2 Crew 2

Construction All metal  
semi-monocoque fuselage,  
cantilever wing.

## SPEED

@ 11911 lbs.	Mph.	Knts.	Altitude
Maximum	302	262	@ S. L.
Maximum 11,685	353	307	@ 18,500'
Cruising Combat	270	235	1500'
Economical Cruising	149	130	1500'

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	2 x 50 kg		220
Maximum	2 x 250 kg		1100

## ENGINES

	H. P.	Altitude
Take-off	1065	S.L.
Normal	785	1500'
Military	1040	9200'
	935	19000'
War Emerg.	1135	8600'
	1030	18500'

## WEIGHTS

	Lbs.
Empty	8335
Gross Night Fighter	11685
Day Fighter	11911
Overload Night Fighter	12349
Day Fighter	12575

## FUEL

	U.S. gal.	Imp. gal.
Built-in	275	229
Internal (Removable)	121	101
External (drop)	106	88
Maximum	502	418

Mfg. Mitsubishi

Model Type 1 1950

Type Radical

Cylinders 14 Cooling Air

Supercharger 2 Speed

Propeller 3 Bl. CS Diam. 9.68'

Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

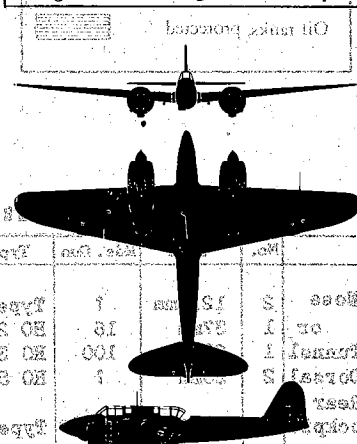
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph	knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1909	1658	151	131	1500	502	418	None	None
Range @ Combat Cr	618	537	273	237	1500	502	418	None	None
Maximum range (normal fuel)	1042	904	149	130	1600	275	229	None	None
Range @ Combat Cr	335	291	270	235	1500	275	229	None	None
Radius (ATA 2)									

## DIMENSIONS

Span 49.5'	Length 34.7'
Height 12.0'	Wing area 365 sq. ft.

## GENERAL DATA

NICK is a maneuverable twin engine aircraft that may be used as a day fighter, night fighter, ground attack plane, (bombed), etc.



DATE June 1945

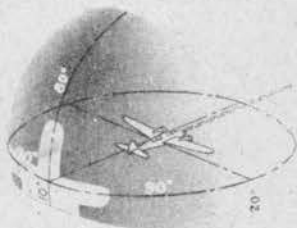
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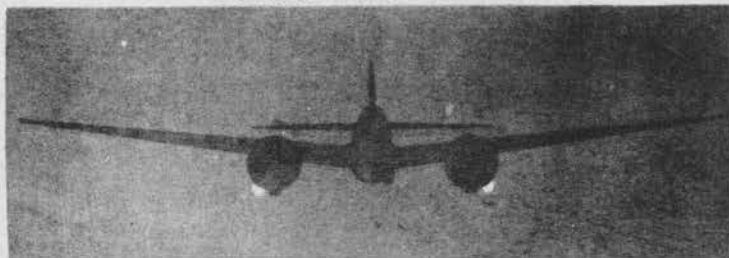
NICK 1

FIELDS OF FIRE



REAR GUN "B" &  
FORWARD GUNS "A" & "C"  
3/4-rear view from above

EXHAUST FLAME PATTERNS



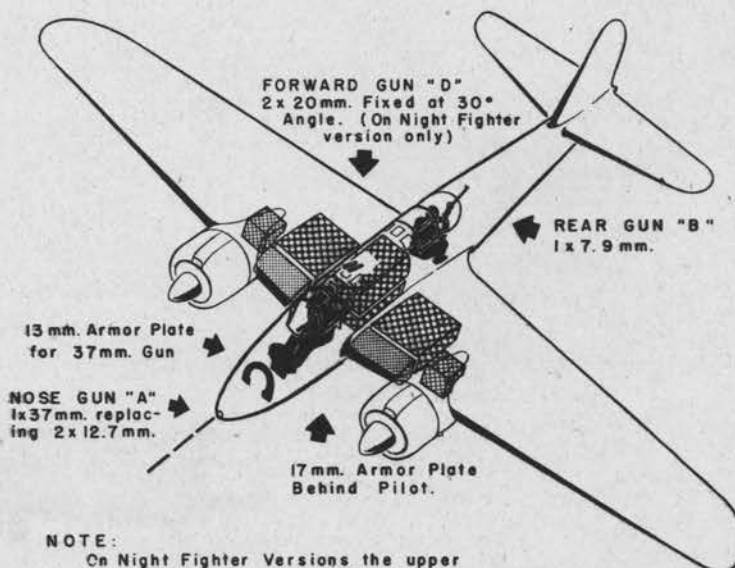
REAR VIEW



TUNNEL GUN "C"  
1x 20 mm.

Provision made for but  
gun not always installed.

VULNERABILITY



## NOTE:

On Night Fighter Versions the upper  
Fuselage Tank is removed to re-  
ceive the 2x20mm. guns.

## LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	2	12.7mm	?	Type 1 Fixed, Browning type.
or	1	37mm	16	HO 203 Fixed cannon.
Tunnel	1	20mm	100	HO 3 Fixed, Gas-operated.
Dorsal	2	20mm	?	HO 5 Fixed, Browning type, (Inclined)
Rear				
Cockpit	1	7.92mm	1050	Type 98 Flexible, German MG 15 type.

## TACTICAL DATA

Inclined HO 5 guns are  
installed on the night  
fighter version.

Armor plate is installed  
behind and ahead of the  
HO 203 magazine and behind  
the pilot. Pilot's head armor  
is two spaced plates.

DATE June 1945

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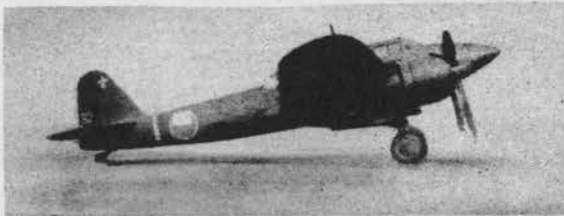
UNCLASSIFIED



UNCLASSIFIED

153A-4

NICK 1



RESTRICTED

DATE June 1945

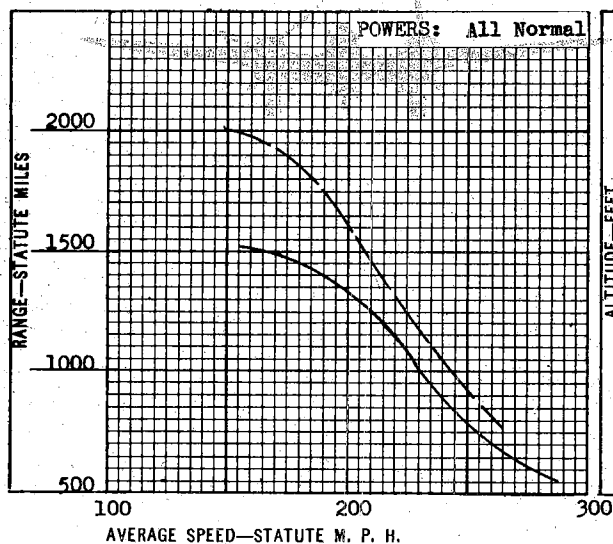
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TONY 1

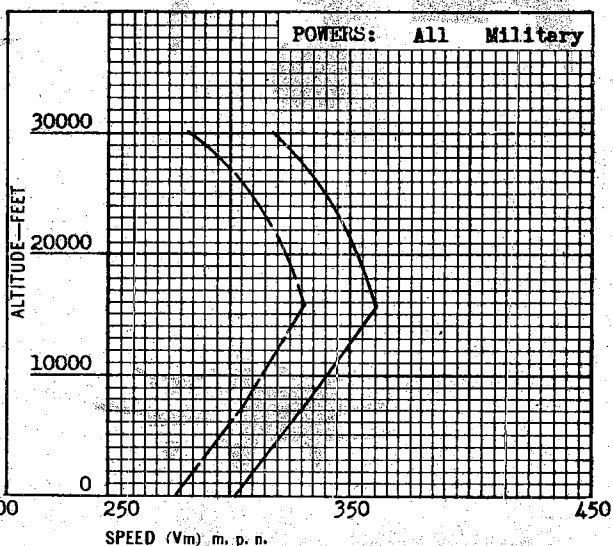
# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL FIGHTER	6982	1194	None
-----	OVERLOAD FIGHTER	7682	1794	None

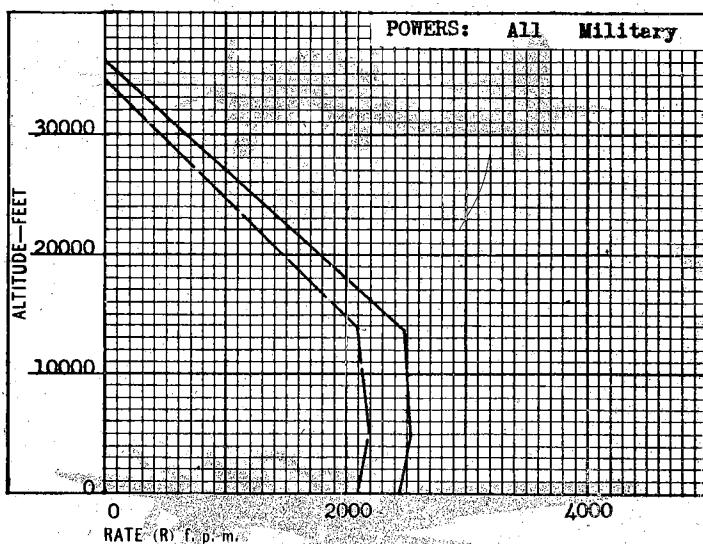
RANGE VS. SPEED



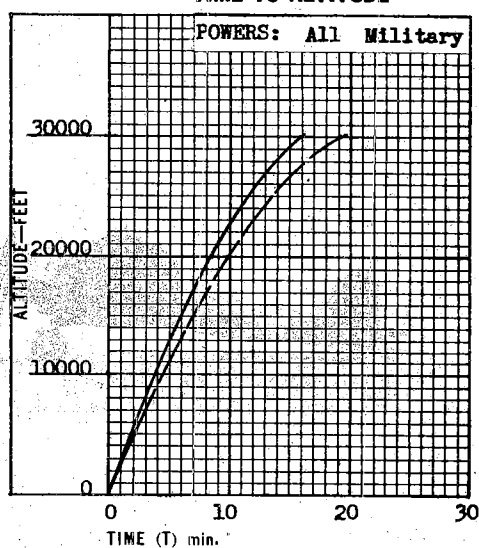
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE December 1944

RECEIVED

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154A-2

## PERFORMANCE AND CHARACTERISTICS

TONY 1

## TAKE-OFF

	Load	Feet
T. O. calm	Gross	744
T. O. 25 kt. wind	Gross	338
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 6982 lbs.	Feet	Min.
Rate @ S. L.	2440	1
Rate @ 13,800 ft.	2470	1
Time to 10,000'		4.0
Time to 20,000'		8.45
Service ceiling	35,100'	

## AIRCRAFT

Duty	Fighter
Designation	Type 3, Ki 61
Description	Low-wing Monoplane
Mfg.	Kawasaki
Engines	1
Crew	1
Construction	All metal

## SPEED

@ 6982 lbs.	Mph.	Knts.	Altitude
Maximum	302	262	@ S. L.
Maximum	361	314	@ 15,800'
Cruising 75%	215	187	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	2	100 kg	440

## ENGINES

	H. P.	Altitude
Take-off	1160	S.L.
Normal	935	5,200'
	940	13,200'
Military	1030	S.L.
	1085	13,800'
War Emerg.	1100	12,600'

## WEIGHTS

	Lbs.
Empty	5010
Gross	6982
Overload	7682

## FUEL

	U. S. gal.	Imp. gal.
Built-in	199	165
Internal (Removable)		
External (drop)	100	83
Maximum	299	248

Mfg. Kawasaki

Model Type 2, 1100 HP

Type Inverted 60° V

Cylinders 12 Cooling Liquid

Supercharger 2 Speed hydraulic

Propeller 3 Blade Diam. 10.3'

Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel) @ 75% VM	2010	1745	148	128	1500	299	248	None	None
	1625	1411	198	171	1500	299	248	None	None
Maximum range (normal fuel) @ 75% VM	1520	1320	156	135	1500	199	165	None	None
	1195	1040	215	187	1500	199	165	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	39.3'	Length	28.9'
Height		Wing area	215 sq.ft.

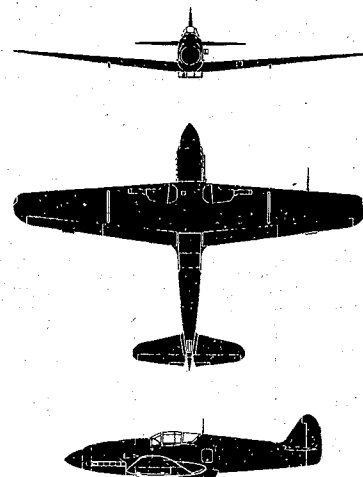
## GENERAL DATA

TONY is equipped with leak proof internal tanks and armor is fitted behind and under the pilot. Because of better fuel and pilot protection this aircraft represents a distinct improvement in Jap fighters.

External wing racks may carry two 50 gallon fuel tanks or two 220 lb. bombs.

DATE December 1944

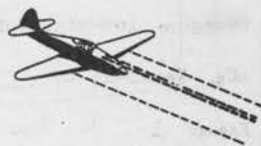
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## TONY 1

## FIELDS OF FIRE

FORWARD GUNS  
"A", AND "B"

¾-front view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY

Auxiliary gas tanks,  
JettisonableFORWARD GUN  
"B" 1 x 7.7 mm.,  
12.7 mm. or 20 mmFORWARD  
GUNS "A"  
2 x 12.7 mm.Armor Plate Behind  
and under PilotLocation of oxygen  
cylinders unknownFORWARD GUN "B"  
1 x 7.7 mm., 12.7 mm. or 20 mm.

## LEGEND

Fuel tanks, unprotected

Fuel tanks, self-sealing

Oil tanks, unprotected

Oil tanks, self-sealing

## ARMAMENT

	No.	Size	Rds. Gun.	Type		No.	Size	Rds. Gun.	Type
Forward	2	12.7 mm		Fixed	Tail				
Top					Wing	2	12.7 mm		Fixed
Side					or	2	20 mm		Fixed
Bottom									

## TACTICAL DATA

Armor plate is used to  
protect the radiator.

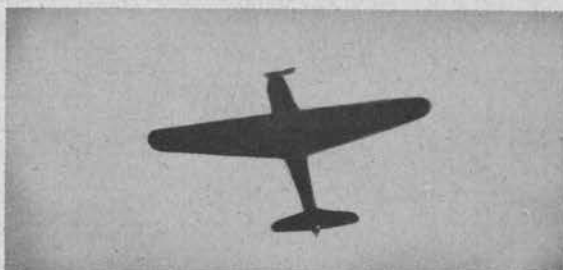
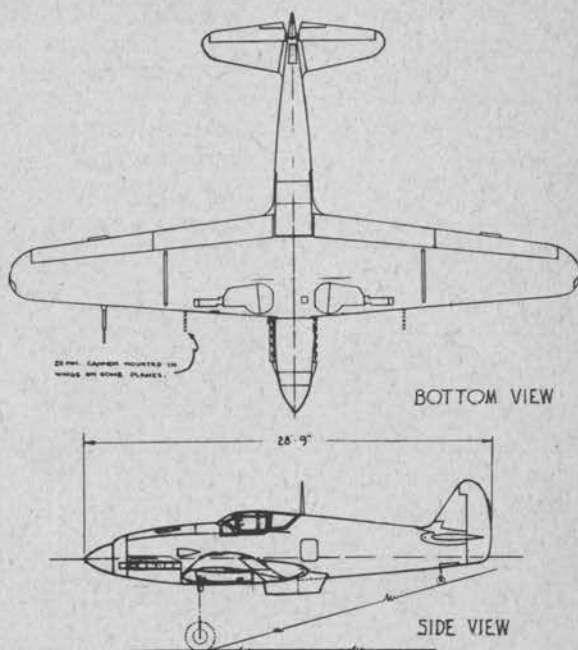
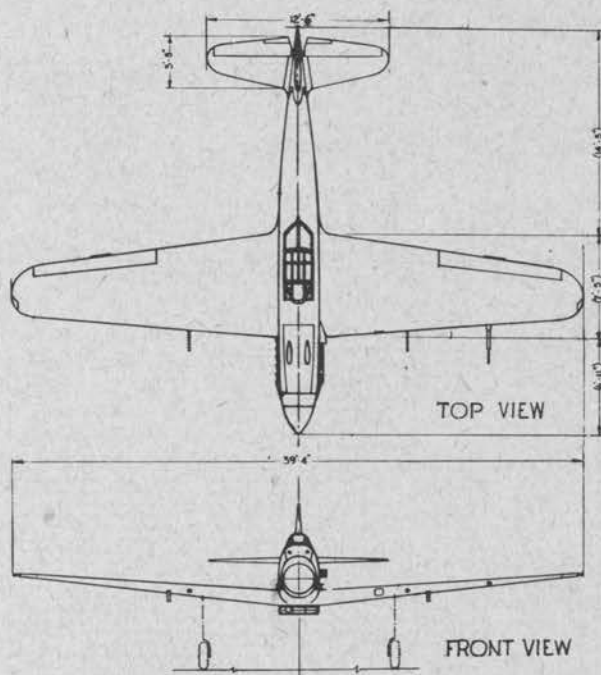
DATE December 1944

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## TONY 1



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DATE December 1944

# UNCLASSIFIED

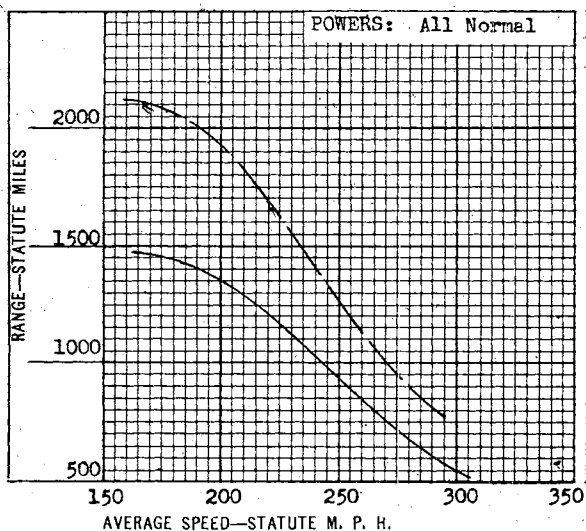
154B-1

TONY 2

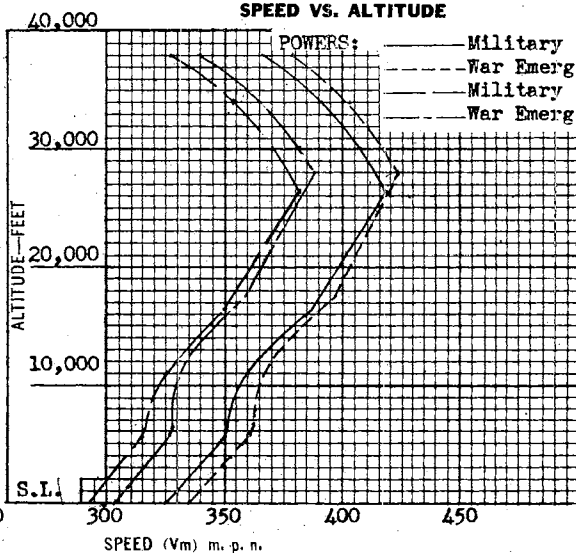
# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL FIGHTER	7232	1196	None
-----	NORMAL FIGHTER	7232	1196	None
————	OVERLOAD FIGHTER	7929	1830	None
-----	OVERLOAD FIGHTER	7929	1830	None

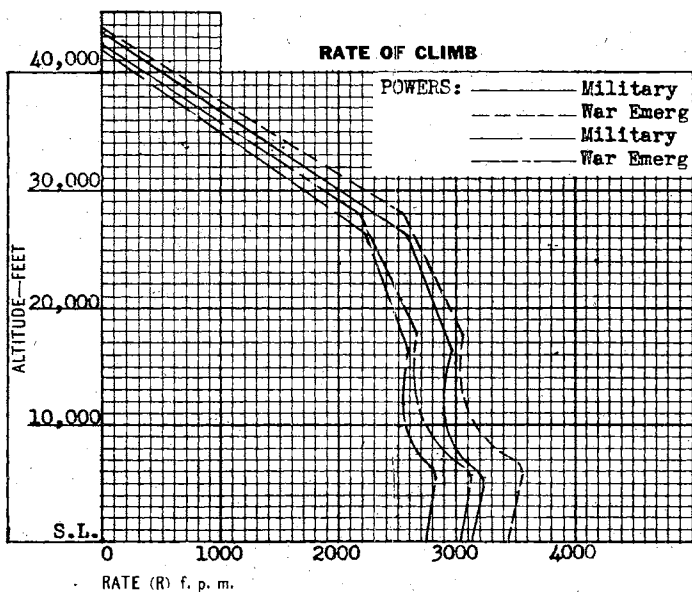
RANGE VS. SPEED



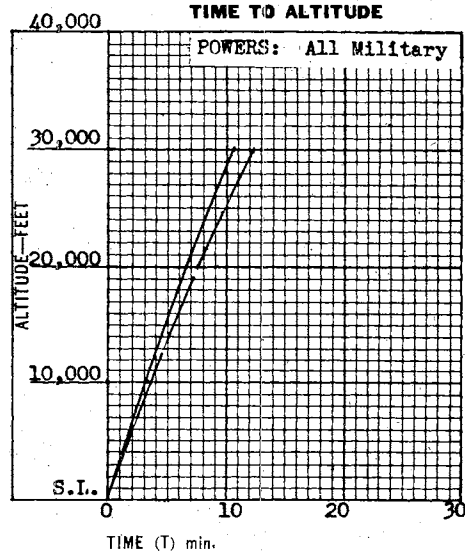
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE March 1945

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## PERFORMANCE

AND

## CHARACTERISTICS

## TONY 2

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	7232	1000
T.O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

## CLIMB—CEILING

@ 7232 lbs.	Feet	Min.
Rate @ S.L.	3120	1
Rate @ 5550 ft.	3230	1
Time to 10,000'		3.2
Time to 20,000'		6.6
Service ceiling	43,300'	

## AIRCRAFT

Duty	Fighter
Designation	Type 3, Model 2 Ki 61
Description	Low-wing Monoplane
Mfg.	Kawasaki
Engines	1 Crew 1
Construction	All Metal

## SPEED

@ 7232 lbs.	Mph.	Knts.	Altitude
Maximum WE	335	291	@ S.L.
Maximum WE	423	368	@ 28,000'
Cruising			
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			None
Maximum	2	100 kg.	440

## ENGINES

	H. P.	Altitude
Take-off	1380	S.L.
Normal		
Military	1320	5550
War Emerg.	1440	5700

## WEIGHTS

	Lbs.
Empty	5260
Gross	7232
Overload	7929

## FUEL

	U.S. gal.	Imp. gal.
Built-in	199	162
Internal (Removable)		
External (drop)	106	93
Maximum	305	255

Mfg. Kawasaki  
Model Ha 140  
Type Inverted 60° Vee  
Cylinders 12 Cooling liquid  
Supercharger 2 Stage variable  
Propeller 4 blade speed Diam. 10' C.S.  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2120	1842	160	139	1500	305	255	None	None
At 75% Vmax.	1655	1436	221	192	1500	305	255	None	None
Maximum range (normal fuel)	1470	1276	163	141	1500	199	162	None	None
At 75% Vmax.	1130	893	229	199	1500	199	162	None	None
Radius ( )									
Radius ( )									

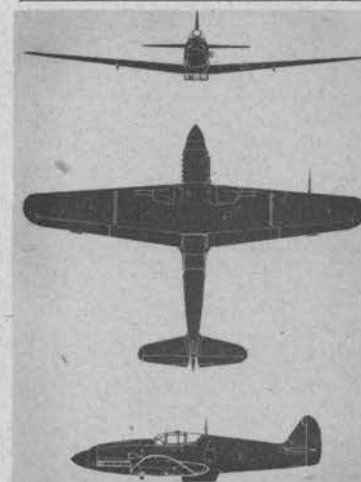
## DIMENSIONS

Span	39.3'	Length	28.9'
Height	9.2'	Wing area	215 sq. ft.

## GENERAL DATA

Performance figures are based on fragmentary documentary evidence and resultant extrapolation of engine ratings.

Photographs are those of TONY 1. Airframe and dimensions are assumed to be the same.



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Provisional Data

DATE March 1945

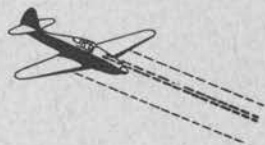
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TONY 2

## FIELDS OF FIRE

FORWARD GUNS  
"A", AND "B"

¾-front view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY

Auxiliary gas tanks,  
Jettisonable

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, self-sealing	
Oil tanks, unprotected	
Oil tanks, self-sealing	

FORWARD GUN  
"B" 1 x 12.7 mm.FORWARD  
GUNS "A"  
2 x 20 mm.Armor Plate Behind  
and under PilotLocation of oxygen  
cylinders unknownFORWARD GUN "B"  
1 x 12.7 mm.

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	12.7 mm	250	Fixed	Tail				
Cowl		or			Wing	2	12.7 mm	200	Fixed
Top	2	20 mm	150	Fixed		2	or	100	Fixed
Side									
Bottom									

## TACTICAL DATA

Armor plate is used to  
protect the radiator.

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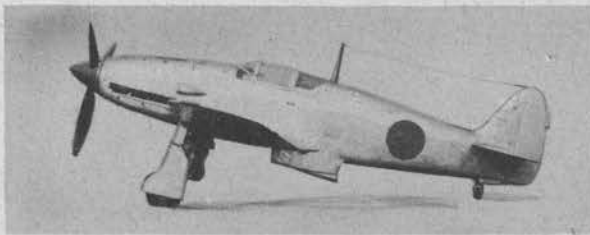
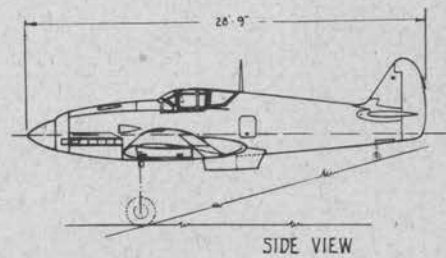
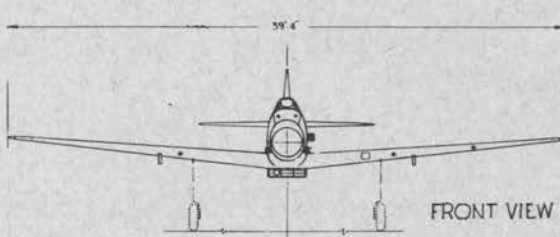
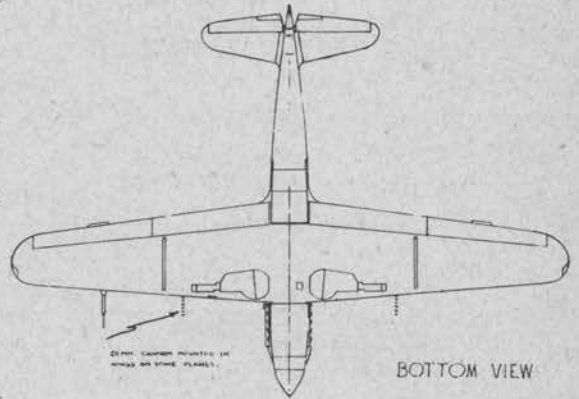
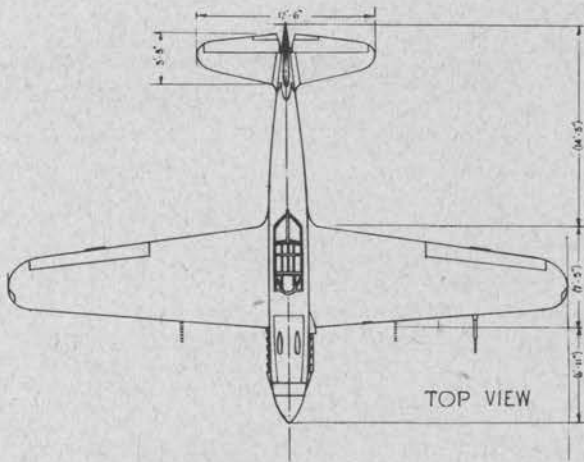
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## TONY 2



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DATE March 1945

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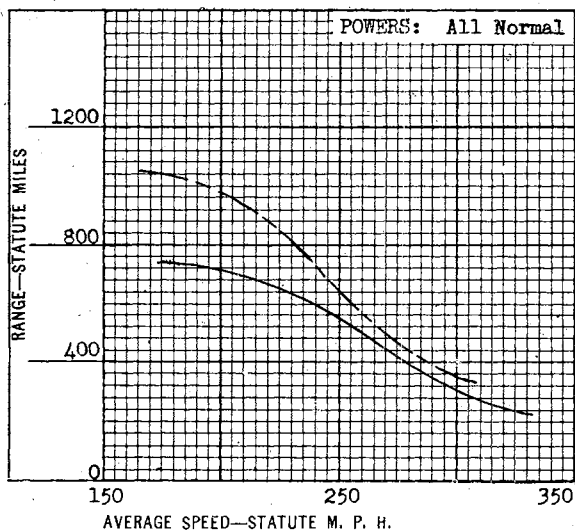
155A-1

TOJO 2

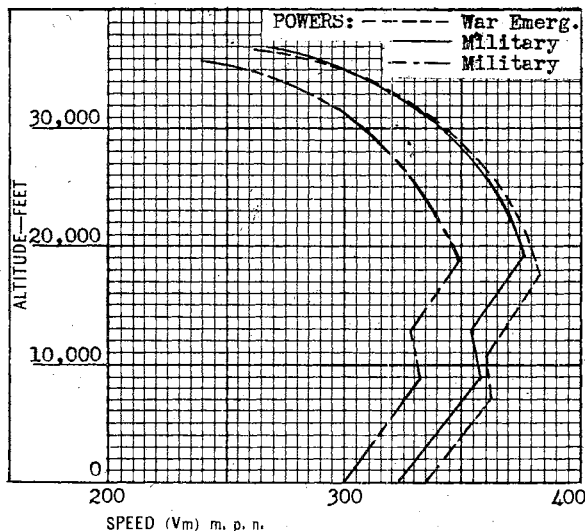
# **RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	NORMAL FIGHTER	6100	768	None
=====	NORMAL FIGHTER	6100	768	None
-----	OVERLOAD FIGHTER	6610	1182	None

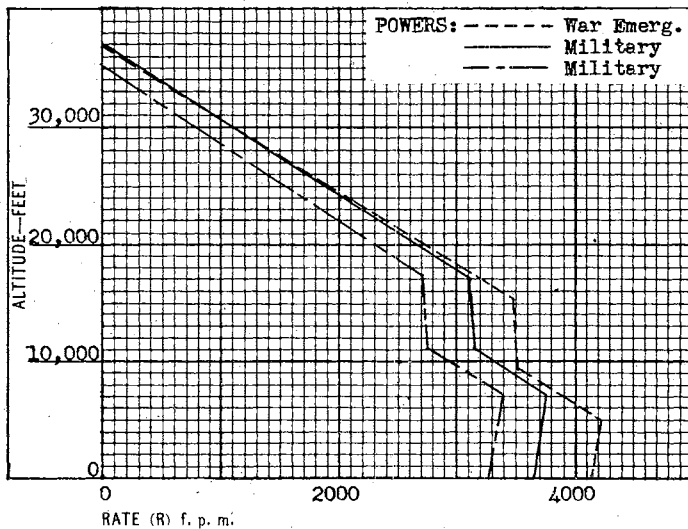
RANGE VS. SPEED



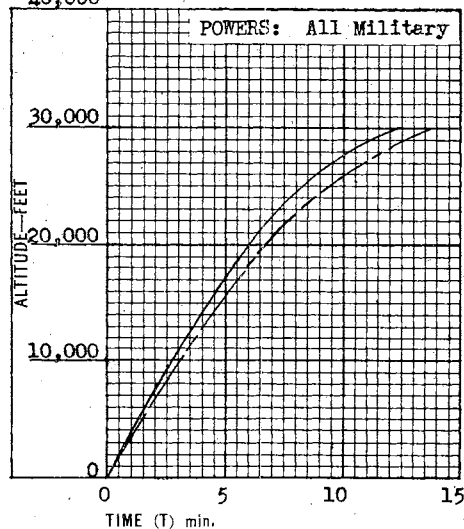
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE March 1945

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## PERFORMANCE AND CHARACTERISTICS

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	6100	990
T. O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

### CLIMB—CEILING

@ 6100	lbs.	Feet	Min.
Rate @ S. L.		3640	1
Rate @ 7000	ft.	4220	1
Time to 10,000'			2.8
Time to 20,000'			6.0
Service ceiling 36,350'			

### AIRCRAFT

Duty Fighter
Designation Type 2, Model 2 Ki 44
Description Low-wing Monoplane
Mfg. Nakajima
Engines 1 Crew 1
Construction All Metal

### SPEED

@ 6100	lbs.	Mph.	Knts.	Altitude
Maximum WE	335	291	@ S. L.	
Maximum WE	383	332	@ 17,400'	
Cruising				
Economical				

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum			

### ENGINES

	H. P.	Altitude
Take-off WE	1500	S.L.
Normal		
Military	1420	7000'
War Emerg.	1300	17200'
	1570	5000'

### WEIGHTS

	Lbs.
Empty	4300
Gross	6100
Overload	6610

### FUEL

	U. S. gal.	Imp. gal.
Built-in	128	106
Internal (Removable)		
External (drop)	69	57
Maximum	197	163

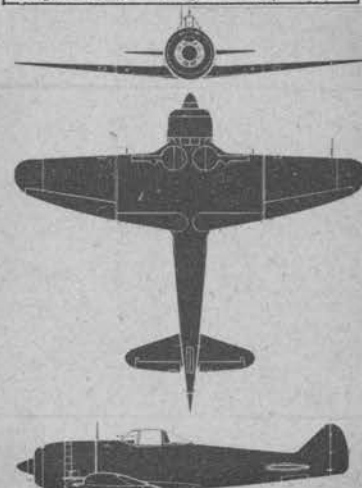
Mfg. Nakajima
Model Type 2, 1450 HP
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 Blade Diam. 10'
C.S.
Fuel—Take-off 92 Cruising 92
Plus methanol

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1050	912	166	144	1500	197	163	None	None
At 75% Vmax.	810	703	230	200	1500	197	163	None	None
Maximum range (normal fuel)	740	643	174	151	1500	128	106	None	None
At 75% Vmax.	565	490	248	215	1500	128	106	None	None
Radius ( )									
Radius ( )									

### DIMENSIONS

Span 31'	Length 29.2'
Height 10.6'	Wing area 169 sq. ft.



### GENERAL DATA

A small compact aircraft that is a pronounced departure from previous Japanese design. Has an exceptional rate of climb and a high diving speed. One series was constructed with 40 mm wing cannon.

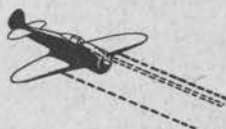
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DATE March 1945



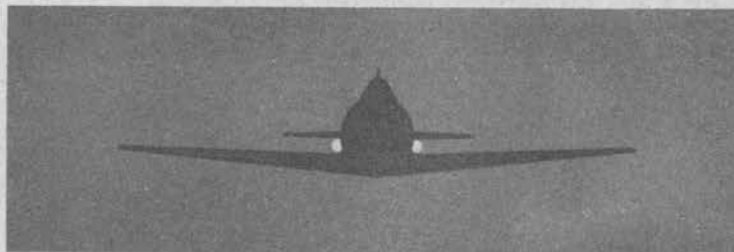
## TOJO 2

## FIELDS OF FIRE



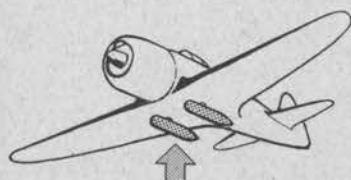
FORWARD GUNS  
"A", AND "B"  
3/4-front view from above

## EXHAUST FLAME PATTERNS



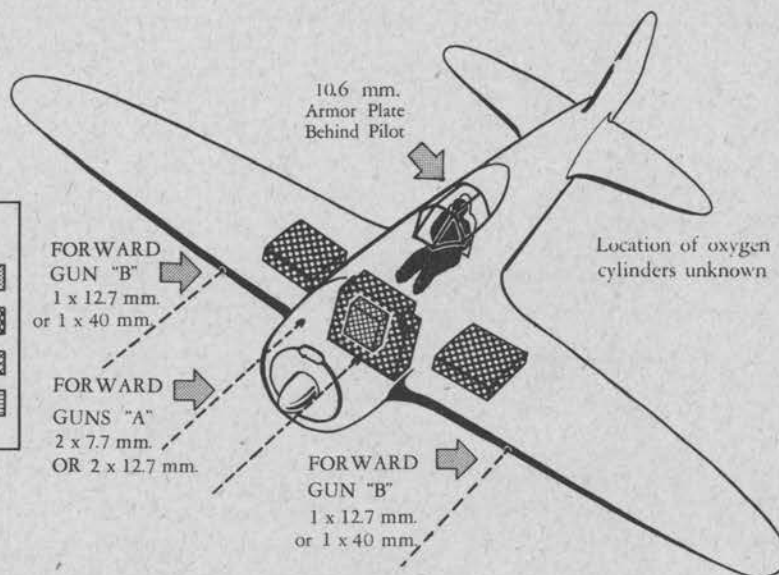
REAR VIEW

## VULNERABILITY



Auxiliary gas tank  
Jettisonable  
Alternate arrangements  
one tank in center.

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Cowl	2	7.7 mm or 12.7 mm	500	Fixed	Tail				
Top	2	12.7 mm	250	Fixed	Wing	2	12.7 mm or 40 mm	250	Fixed
Side						2	40 mm	10(?)	Fixed
Bottom									

## TACTICAL DATA

TOJO is restricted against snap rolls, spins, stalls and inverted flight at high speeds. This plane is equipped with armor plate behind the pilot and self sealing fuel tanks ineffective against .50 calibre fire.

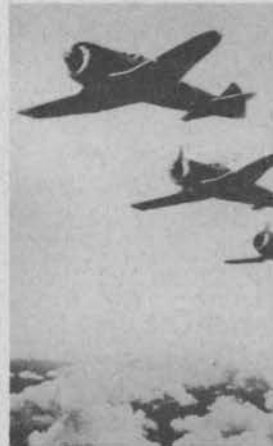
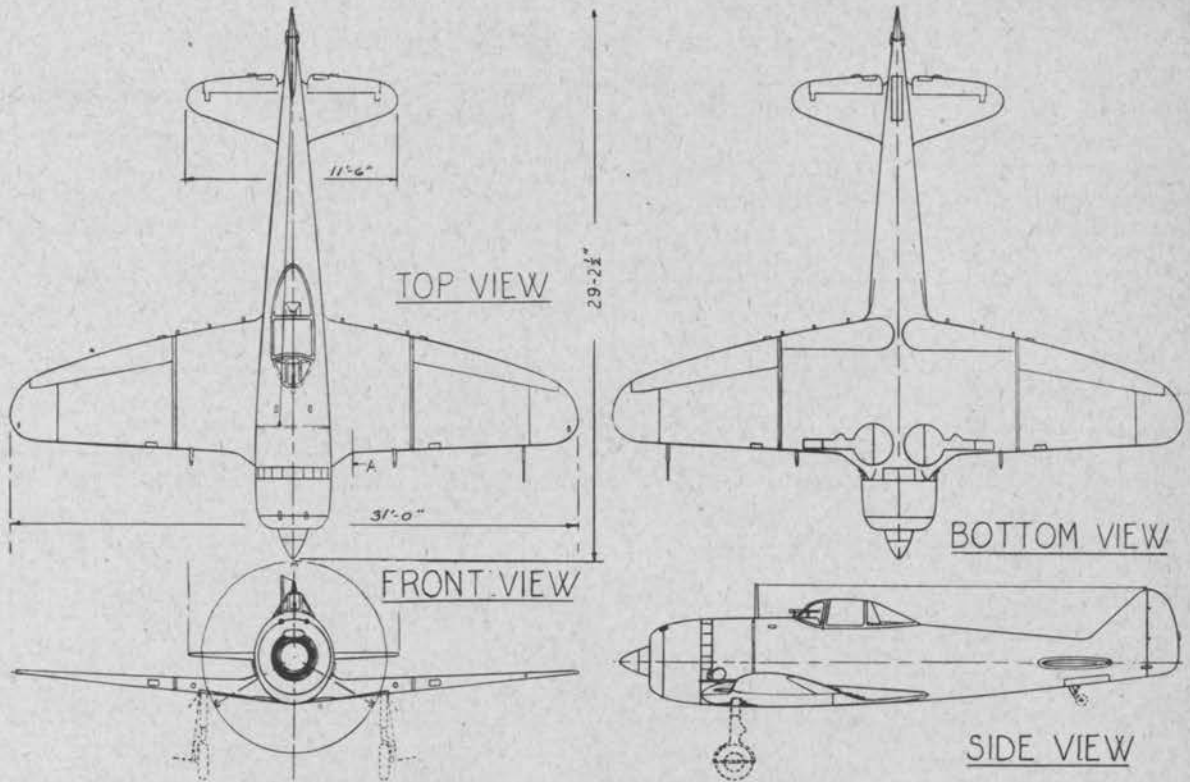
DATE March 1945

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TOJO 2



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DATE December 1944

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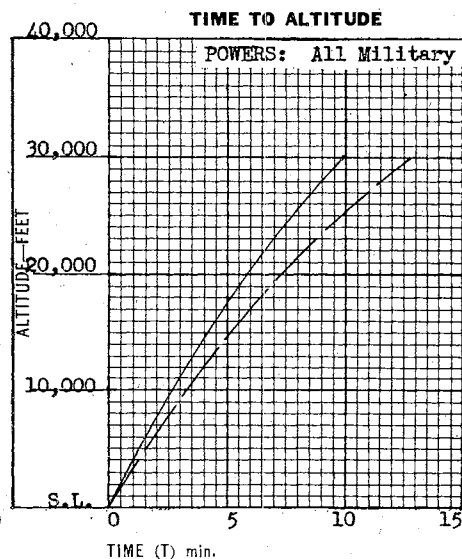
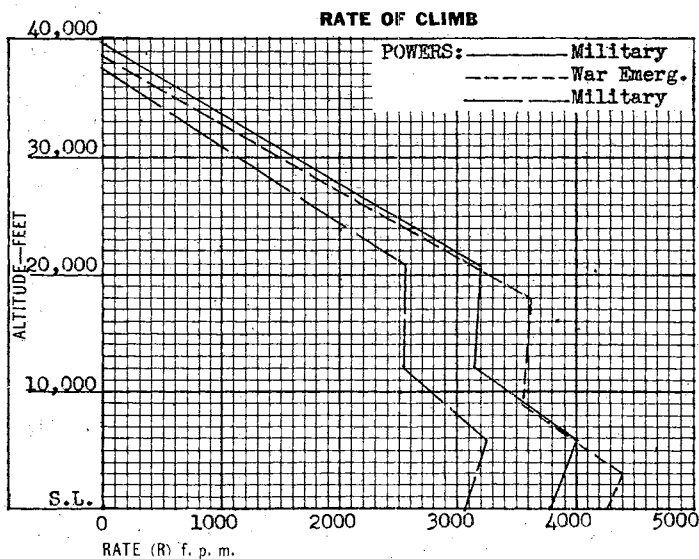
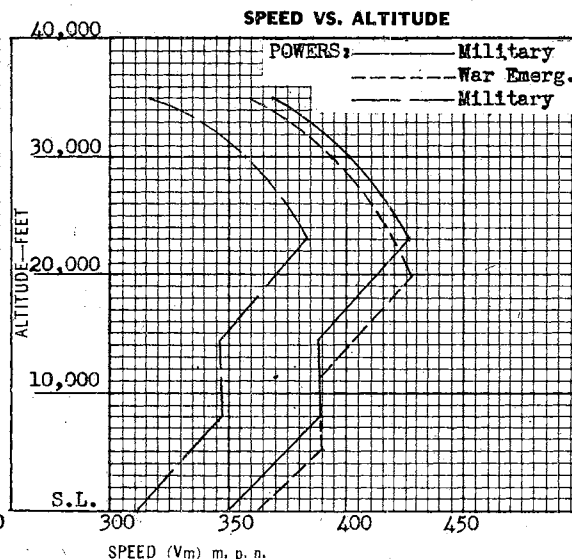
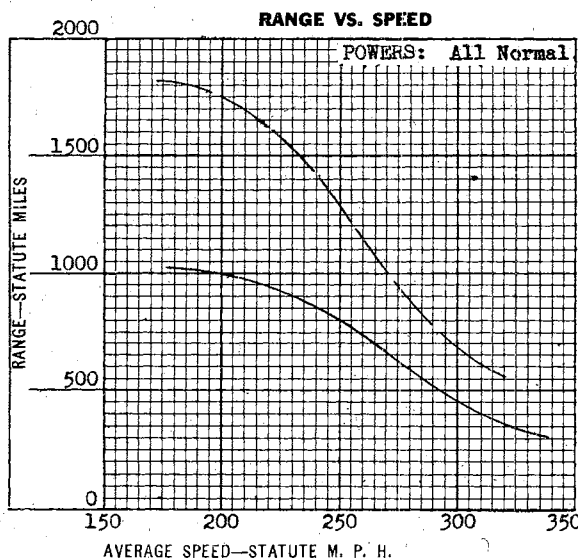


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## FRANK 1

### RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
—	NORMAL FIGHTER	7940	1110	None
- - -	NORMAL FIGHTER	7940	1110	None
—	OVERLOAD FIGHTER	9194	2088	None



DATE March 1945

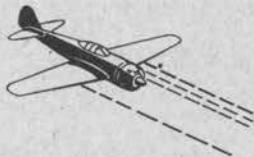
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## FRANK 1

## FIELDS OF FIRE



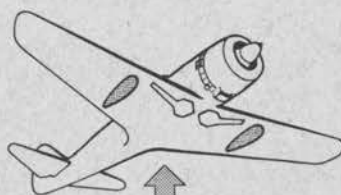
FORWARD GUNS "A," AND "B"  
¾-front view from above

## EXHAUST FLAME PATTERNS



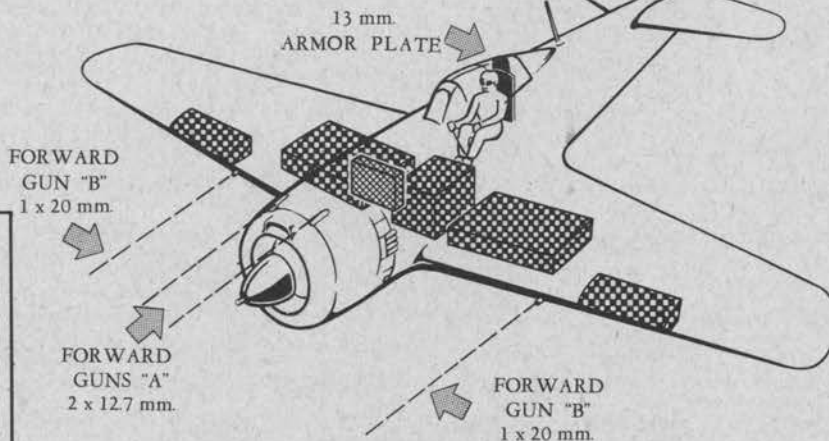
REAR VIEW

## VULNERABILITY



Auxiliary gas tank  
Jettisonable

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Cowl	2	12.7 mm	350	Fixed	Tail				
Top					Wing	2	20 mm	150	Fixed
Side									
Bottom									

## TACTICAL DATA

Documents state that FRANK has a bullet-proof windshield 65 mm thick. Armor plate is provided for pilot's back and head.

DATE March 1945

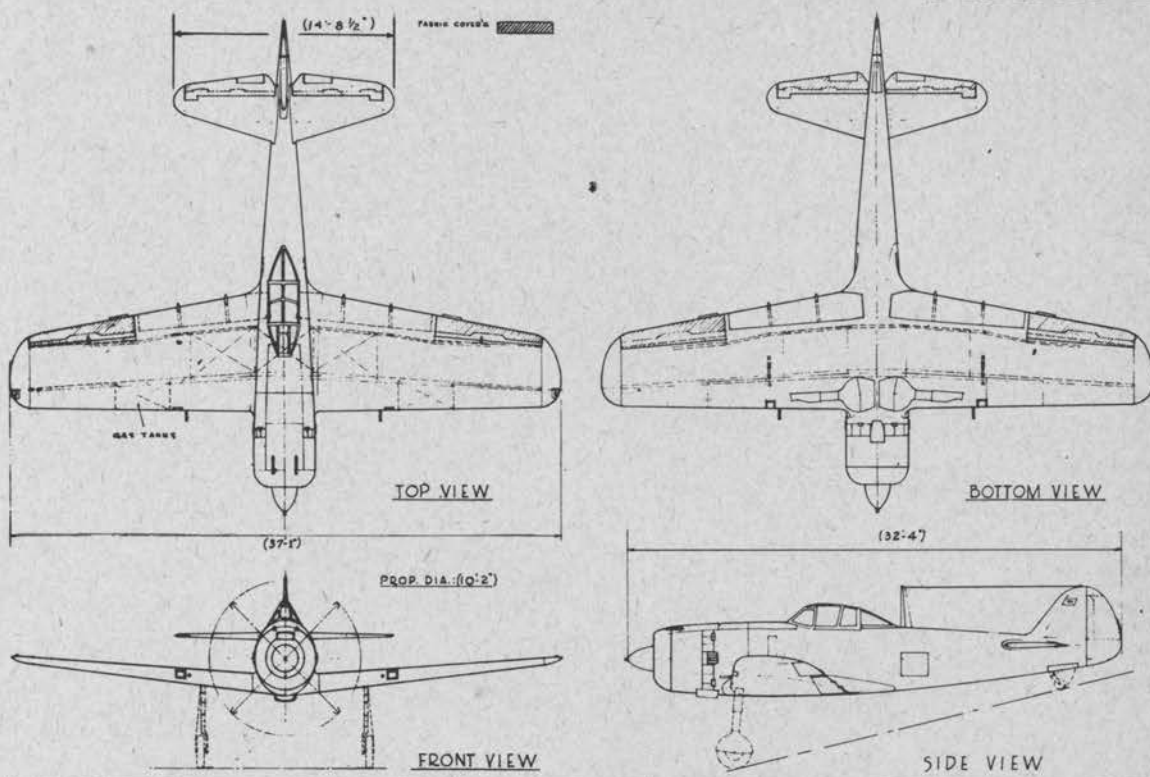
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FRANK 1



RESTRICTED

DATE March 1945

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ROB 1

UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

ARMAMENT

TACTICAL DATA

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

No information.
-----------------

DATE December 1944

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## PERFORMANCE AND CHARACTERISTICS

ROB 1

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty	High Speed Fighter		
Designation	Ki 64		
Description	In-line Engine Fighter		
Mfg.	Kawasaki		
Engines	2	Crew	1
Construction			

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off		
Normal		
Military		
War Emerg.		

## WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

Mfg.	
Model	HA 201
Type	
Cylinders	Cooling
Supercharger	
Propeller	Diam.
Fuel - Take-off	Cruising

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	Length
Height	Wing area sq.ft.

## GENERAL DATA

ROB 1 is reputed to be a high speed fighter made by Kawasaki with a Ha 201 in-line engine, a tandem arrangement probably composed of two modified DB engines (Jap version). The nose should be very pronounced and much more distinctive than those of either the Army fighter TONY or the Navy dive bomber JUDY, the only other Jap combat aircraft with inline engines at present. Exceptionally high speed is attributed.

Provisional Data

DATE December 1944

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**STEVE 1****UNCLASSIFIED**

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

**TACTICAL DATA**

No information.

DATE December 1944

**UNCLASSIFIED****RESTRICTED**

## PERFORMANCE

## AND

## CHARACTERISTICS

## STEVE 1

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty	High Speed Fighter
Designation	Ki 73
Description	
Mfg.	
Engines	Crew
Construction	

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

## BOMBS—CARGO

	No.	Size	Total lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
Normal		
Military	1825 1665	4,590' 16,400'
War Emerg.	2040	3,100'
Mfg. Mitsubishi		
Model HA 42, Model 11		
Type Radial		
Cylinders 18	Cooling Air	
Supercharger 2 Speed	Fan assisted	
Propeller	Diam.	
Fuel - Take-off 92 Cruising 92		

## WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	Length
Height	Wing area sq.ft.

## GENERAL DATA

STEVE 1 is a Type 3 "super high speed fighter" whose production status is not known. No recognition or performance data is available at present. Based on its type 3 designation, however, it may be nearing an operational stage. Speed and rate of climb should be comparable to FRANK 1.

Provisional Data

DATE December 1944

UNCLASSIFIED

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**PAT 1** UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

**TACTICAL DATA**

No information.

DATE December 1944

RESTRICTED

UNCLASSIFIED

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## PERFORMANCE AND CHARACTERISTICS

PAT 1

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty	Long Range Fighter
Designation	Ki 74
Description	
Mfg.	Tachikawa
Engines	Crew
Construction	

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off		
Normal		
Military		
War Emerg.		

## WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

## Mfg.

Model HA 221

## Type

Cylinders Cooling

Supercharger

Propeller Diam.

Fuel - Take-off Cruising

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	Length
Height	Wing area sq.ft.

## GENERAL DATA

PAT 1 (Ki 74) is listed as a "super range, high speed fighter" probably intended for long range escort duty. It is designed by Tachikawa and is reported to be fitted with the Ha 221 engine - whether single or twin is not known. Performance data or stage of development are not known, but with the present tendency of the Japanese to stress defensive fighter types, it seems doubtful that much productive effort will be spent on PAT.

Provisional Data

DATE December 1944

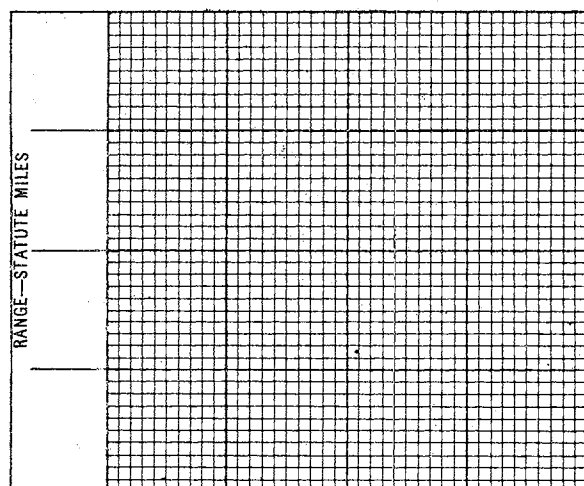
UNCLASSIFIED

# GLEN 11

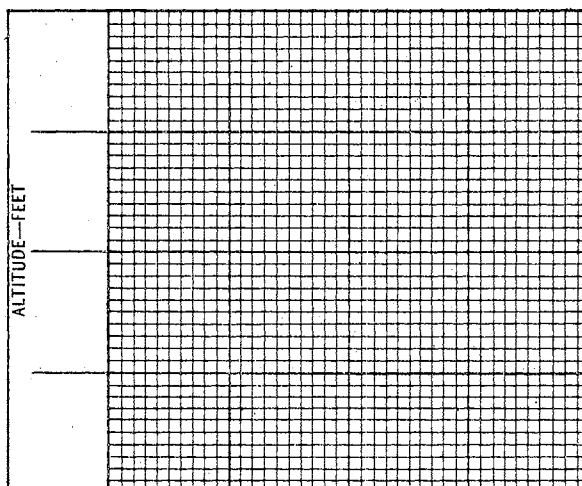
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)

RANGE VS. SPEED



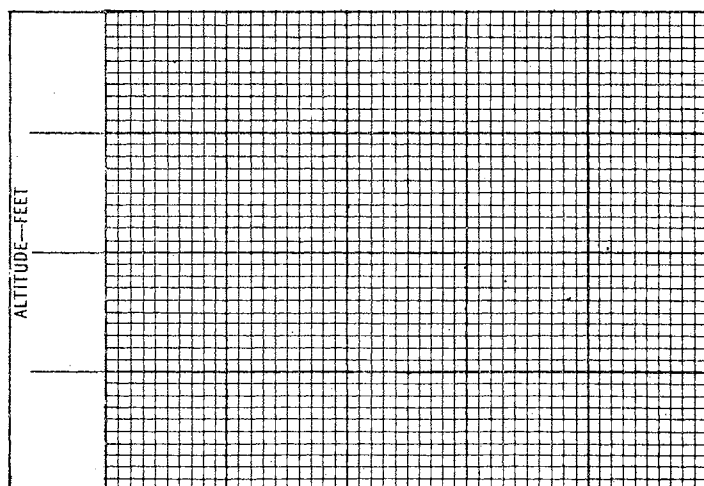
SPEED VS. ALTITUDE



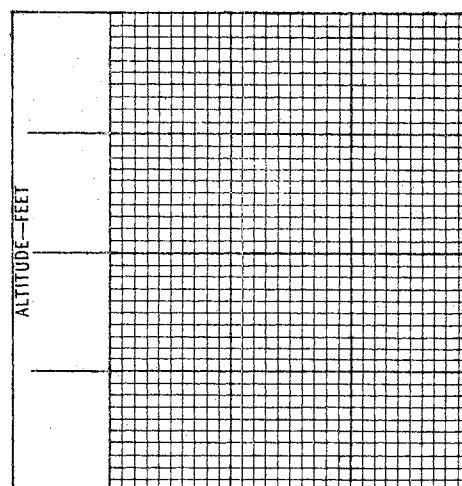
AVERAGE SPEED—STATUTE M. P. H.

SPEED (Vm) m. p. h.

RATE OF CLIMB



TIME TO ALTITUDE



RATE (R) f. p. m.

TIME (T) min.

DATE December 1944

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## PERFORMANCE

AND

## CHARACTERISTICS

## GLEN 11

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty	Submarine Borne Recce Plane		
Designation	Type O, Model 11		
Description	Low-wing Monoplane Twin float		
Mfg.	Yokosuka (?)		
Engines	1	Crew	2
Construction	Composite - Metal and Fabric		

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising 75% max.	92	80	(?)	
Diving Speed		190		
Economical				

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	360	S.L.
Normal	300	S.L.
Military	205	13,123'
War Emerg.		

## WEIGHTS

	Lbs.
Empty	2392
Gross	3197
Overload	3527

## FUEL

	U.S. gal.	Imp. gal.
Built-in	89.8	75.5
Internal (Removable)		
External (drop)		
Maximum	89.8	75.5

Mfg.	Tokyo Gasu Denki	
Model	Amakaze Model 11	
Type	Radial	
Cylinders	9	Cooling Air
Supercharger	None	
Propeller	2 Blade	Diam. 8.2
	Fixed Pitch	
Fuel - Take-off		Cruising

## RANGE AND RANGE

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	500	435	(approx.)			89.8	75.5		
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	35.97'	Length	28.01'
Height	12.09'	Wing area	sq.ft.

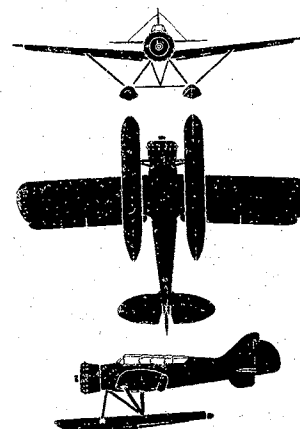
## GENERAL DATA

Scanty documentary information discloses GLEN 11 to be a submarine borne reconnaissance plane whose primary requirement is ease of disassembly and stowage at the sacrifice of performance.

Flimsy construction, low performance, and minimum armament make the value of this aircraft questionable.

Overload weight is maximum catapult weight.

DATE December 1944



UNCLASSIFIED



**GLEN 11**

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Rear	1	7.7 mm	290	Flex.					
Cockpit									
Side									
Bottom									

**TACTICAL DATA**

All major assemblies may be quickly dismantled.

Gas tanks fit on top of wings and are faired into cockpit.

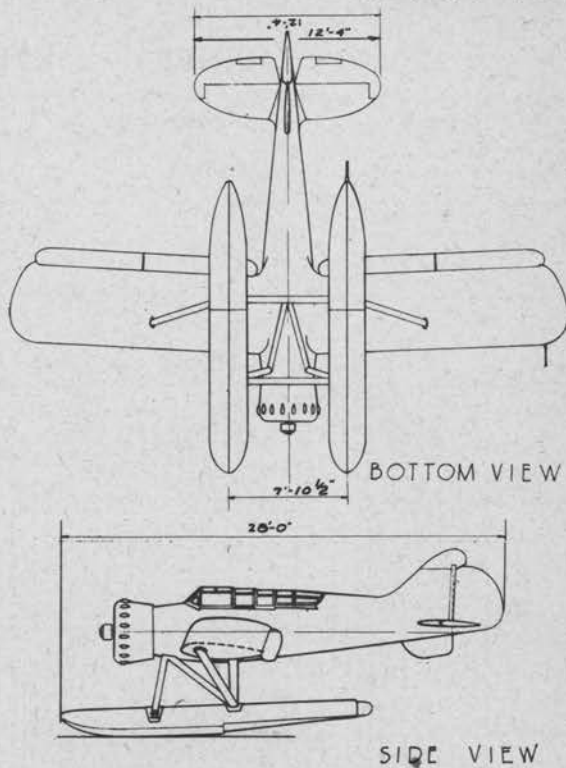
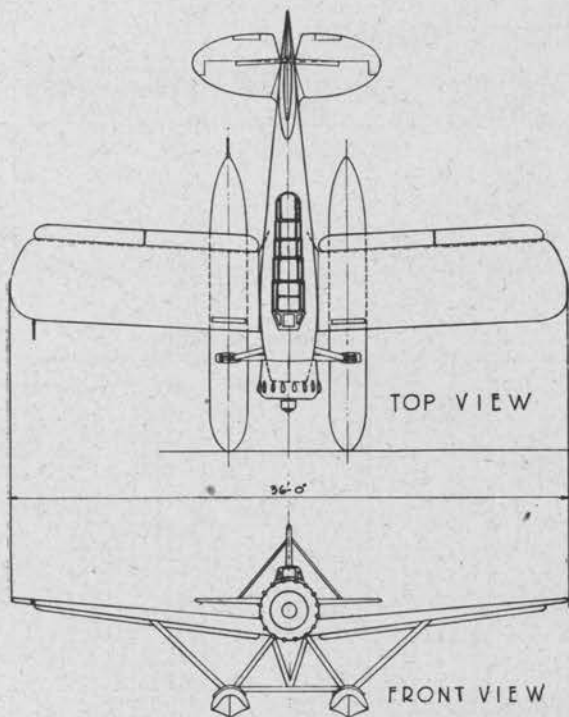
DATE December 1944

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GLEN 11



RESTRICTED

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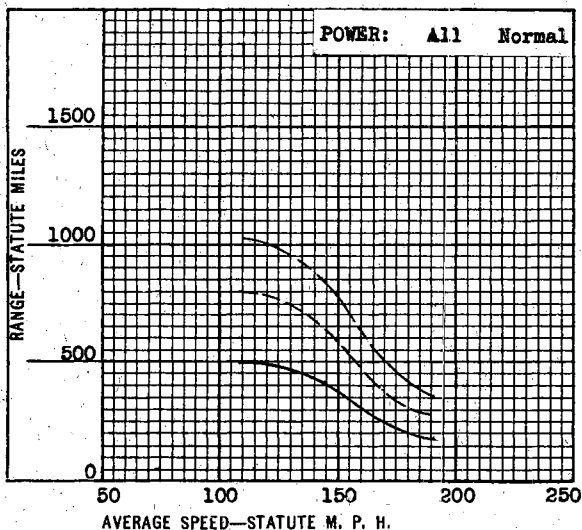
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DATE December 1944

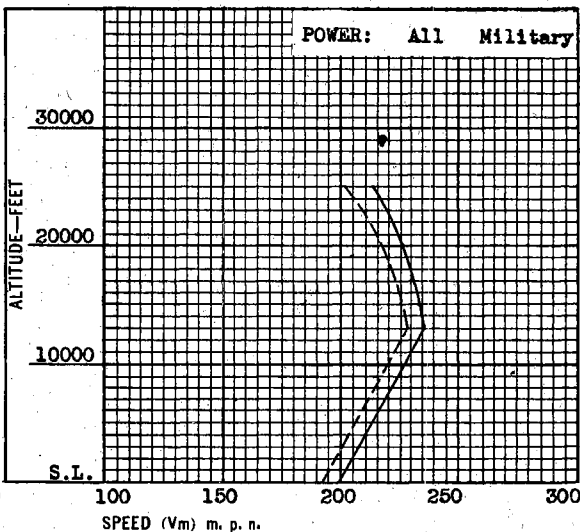
# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	SCOUT	5625	469	None
-----	BOMBER	6200	994	265
-----	SCOUT	6200	1000	None

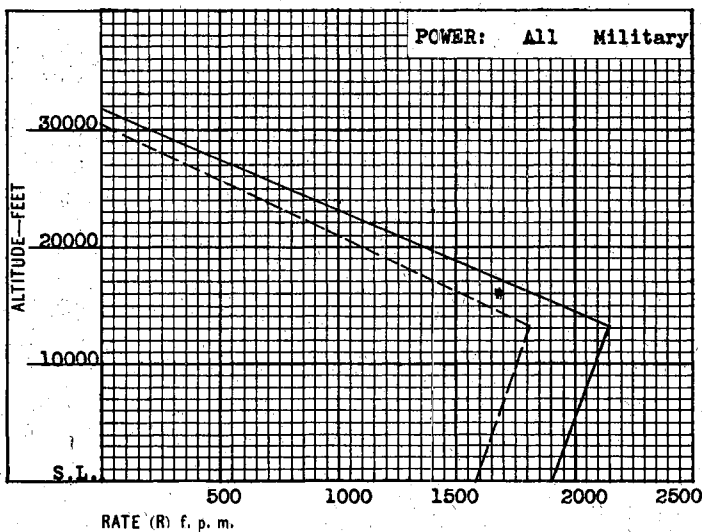
RANGE VS. SPEED



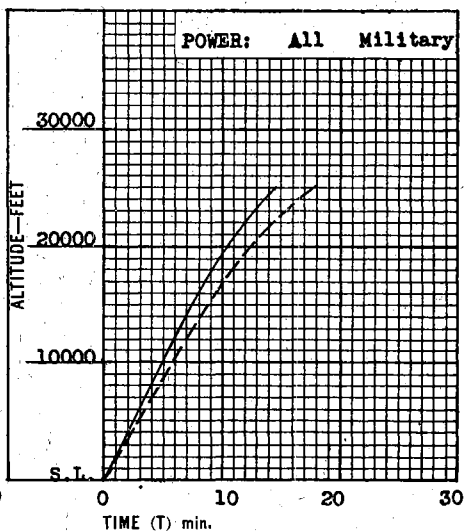
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE March 1945

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## PERFORMANCE AND CHARACTERISTICS

PETE 11

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 5625 lbs.	Feet	Min.
Rate @ S.L.	1900	1
Rate @13,100 ft.	2150	1
Time to 10,000'		5.0
Time to 20,000'		10.4
Service ceiling 30,900'		

## AIRCRAFT

Duty Reconnaissance
Designation Type 0
Description Central float Biplane
Mfg. Sasebo Naval Arsenal Mitsubishi
Engines 1 Crew 2
Construction All Metal

## SPEED

@ 5625 lbs.	Mph.	Knts.	Altitude
Maximum	199	173	@ S. L.
Maximum 75% Vmax. Cruising	236 144	204 125	@13,100' 1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	2	60 kg	264

## ENGINES

	H. P.	Altitude
Take-off	840	S.L.
Normal	565	1500'
Military	865	13,100'
War Emerg.	910	11,400'

## WEIGHTS

	Lbs.
Empty	4250
Gross	5625
Overload	6200

## FUEL

	U.S. gal.	Imp. gal.
Built-in	166	135
Internal (Removable)		
External (drop)		
Maximum	166	135

Mfg. Mitsubishi

Model Zuisei Model 13

Type Radial

Cylinders 14 Cooling Air

Supercharger Single Speed

Propeller 3-Blade Diam. 9.5' CSVP

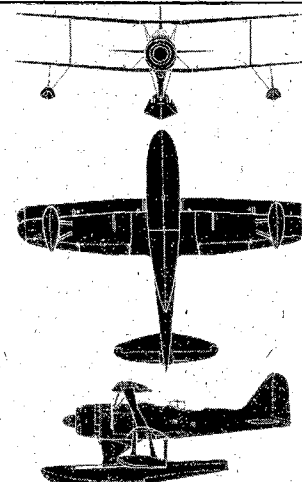
Fuel - Take-off 87 Cruising 87

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1025	890	111	96	1500	166	135	None	
Maximum range (normal fuel)	800	695	109	95	1500	132	110	263	
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 36'	Length 31'
Height 15'	Wing area 318.2 sq. ft.



## GENERAL DATA

Although PETE is used principally for short range observation, it can carry two bombs under the wings on racks outside the propeller arc.

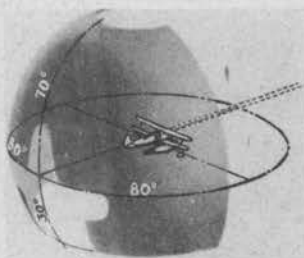
DATE March 1945

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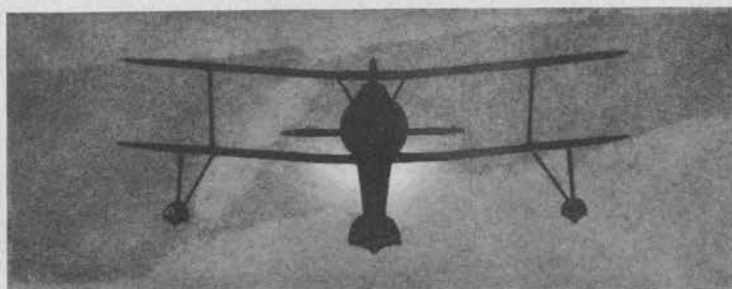
## PETE 11

## FIELDS OF FIRE



TOP GUN "B" AND  
FORWARD GUNS "A"  
3/4-rear view from above

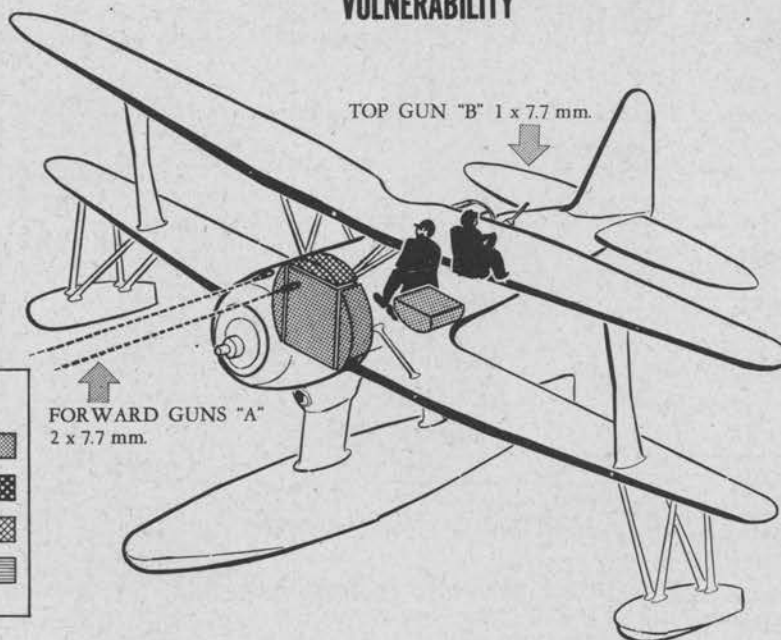
## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY

Location of oxygen  
cylinders unknown



## LEGEND

Fuel tanks, unprotected



Fuel tanks, self-sealing



Oil tanks, unprotected



Oil tanks, self-sealing



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Cowl	2	7.7 mm		Fixed	Tail				
Top					Wing				
Rear									
Cockpit	1	7.7 mm		Flex.					
Side									
Bottom									

## TACTICAL DATA

PETE 11 has neither armor  
nor fuel tank protection

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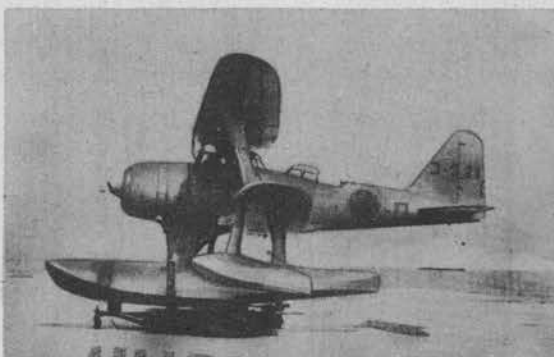
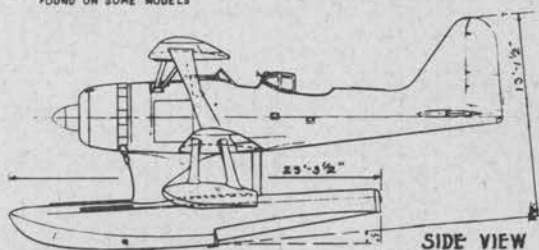
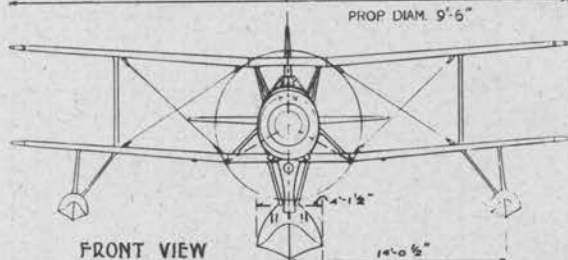
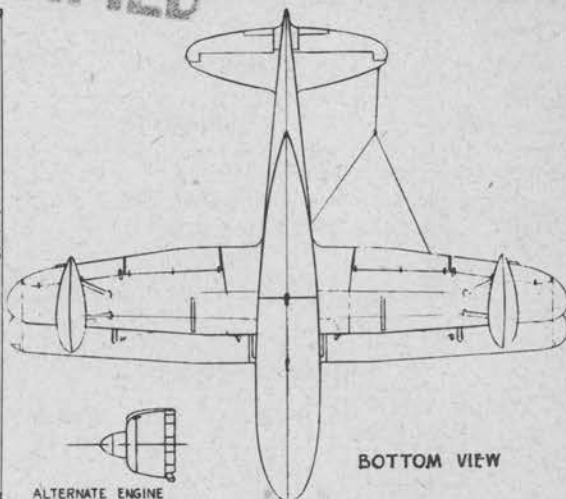
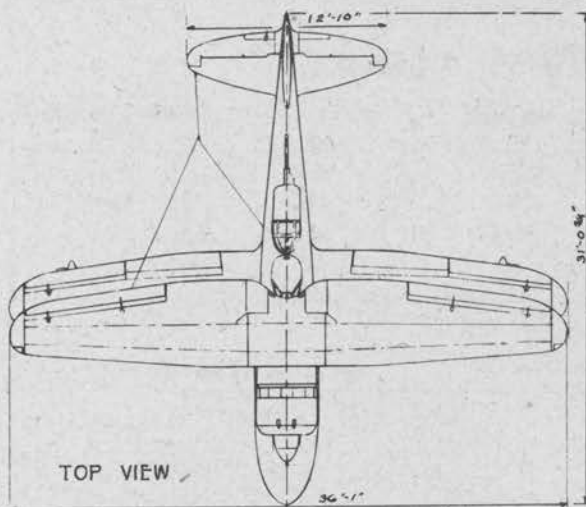
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## PETE 11



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DATE March 1945

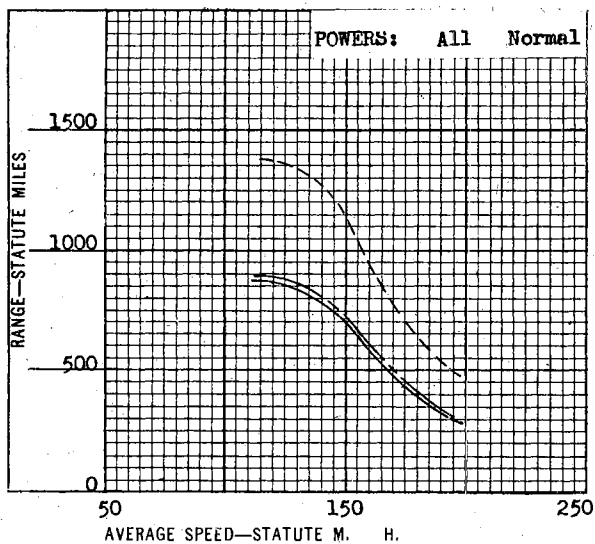
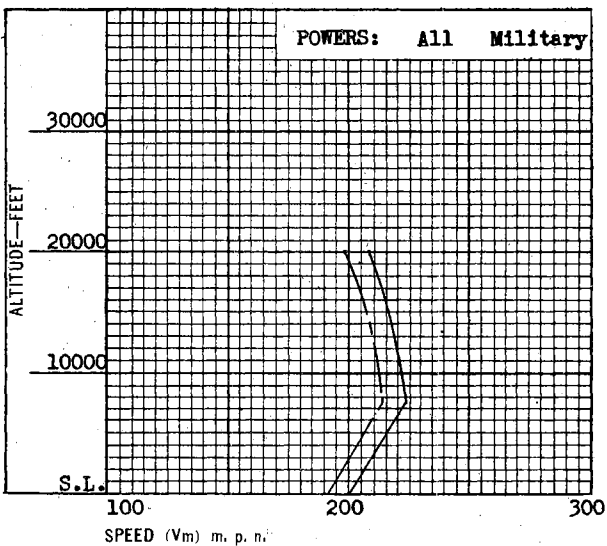
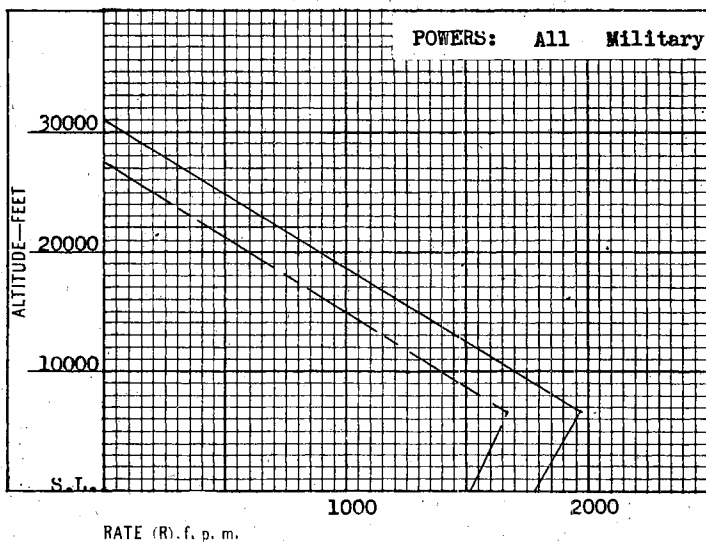
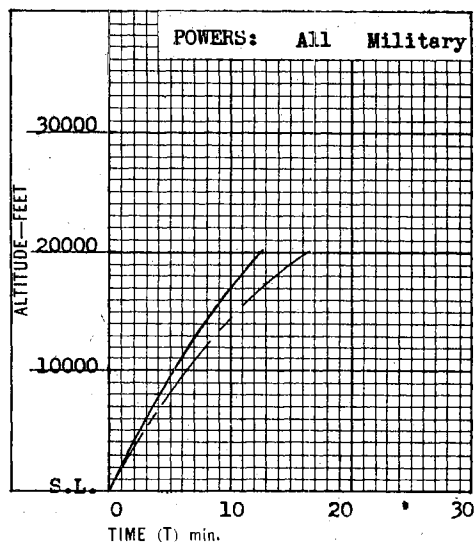
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**JAKE 11****RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
	RECONNAISSANCE	8050	1074	None
---	RECONNAISSANCE (Max. Fuel)	8820	1786	None
---	OVERLOAD BOMBER	8820	1210	530

**RANGE VS. SPEED****SPEED VS. ALTITUDE****RATE OF CLIMB****TIME TO ALTITUDE**

DATE December 1944

UNCLASSIFIED

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## PERFORMANCE AND CHARACTERISTICS

JAKE 11

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 8050	lbs.	Feet	Min.
Rate @ S.L.		1790	1
Rate @ 6600 ft.		1960	1
Time to 10,000'			5.4
Time to 20,000'			12.9
Service ceiling 29,800'			

## AIRCRAFT

Duty Reconnaissance Bomber
Designation Type O, Model 11
Description Low wing, twin float monoplane
Mfg. Watanabe
Engines 1 Crew 3
Construction Metal, except plywood tail and wing tips.

## SPEED

@ 8050 lbs.	Mph.	Knts.	Altitude
Maximum	201	174	@ S. L.
Maximum	222	192	@ 7600'
Cruising 75%	150	130	1500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	4	x 60 kg	530

## ENGINES

	H. P.	Altitude
Take-off	1045	S.L.
Normal		
Military	985 1065	S.L. 6600'
War Emerg.		

## WEIGHTS

	Lbs.
Empty	5820
Gross	8050
Normal Recco	
Overload Bomber or Max. Fuel Recco.	8820

## FUEL

	U.S. gal.	Imp. gal.
Built-in	179	149
Internal (Removable)	118	98
External (drop)		
Maximum	297	247

Mfg. Mitsubishi  
Model Kinsei 43  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger Single Speed  
Propeller 3 Blade Diam. 10.1'  
C.S.  
Fuel - Take-off 92 Cruising 87

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1375	1194	119	103	1500	297	247	None	None
At 75% Vmax.	1160	1007	148	128	1500	297	247	None	None
Maximum range (normal fuel)	875	760	112	98	1500	179	149	None	None
At 75% Vmax.	710	617	150	130	1500	179	149	None	None
Radius ( )									
Radius ( )									

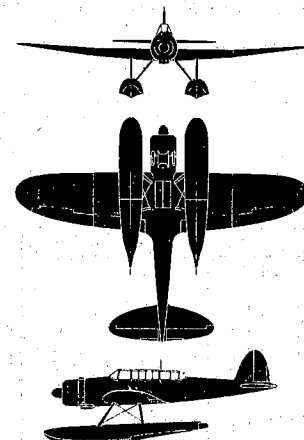
## DIMENSIONS

Span 46.8'	Length 37.2'
Height	Wing area 390 sq.ft.

## GENERAL DATA

JAKE is a twin float plane used by the Navy as a reconnaissance bomber in practically all of the Pacific theaters.

With a 530 lb. bomb load and 202 gallons of fuel in an overload bomber condition, JAKE has a slightly greater range than that given under Maximum Range (Normal Fuel).



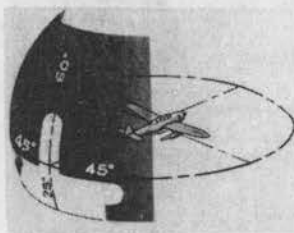
DATE December 1944

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## JAKE 11

## FIELDS OF FIRE



TOP GUN "B" 1 x 20 mm.  
 $\frac{3}{4}$ -rear view from above  
 Approx. field of fire

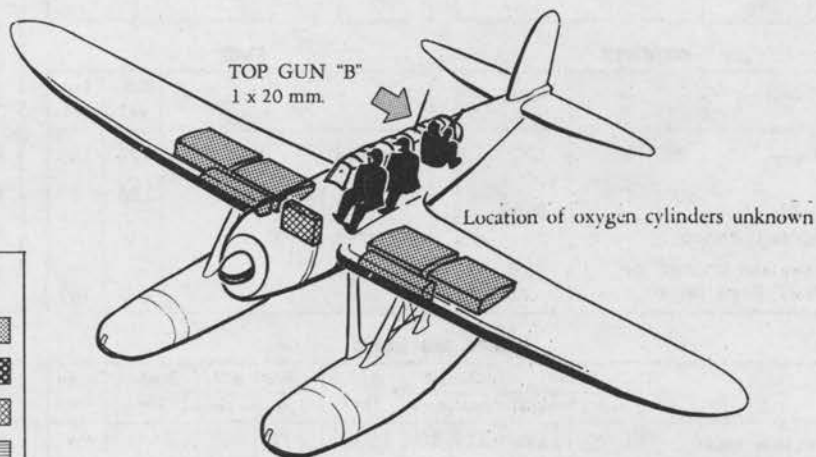
## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY

NOTE:  
 Not known whether  
 other guns are carried



## LEGEND

Fuel tanks, unprotected



Fuel tanks, self-sealing



Oil tanks, unprotected



Oil tanks, self-sealing



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top	1	20 mm	60	Flex.	Wing				
Rear	1	7.7mm	280	Flex.					
Cockpit									
Bottom									

## TACTICAL DATA

New JAKES are being equipped with a flexible 20 mm cannon in the rear cockpit. This would seem to be an awkward installation and difficult to control. Neither armor plate or self-sealing tanks are known to be used on this plane.

DATE December 1944

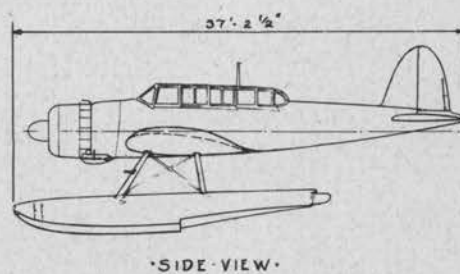
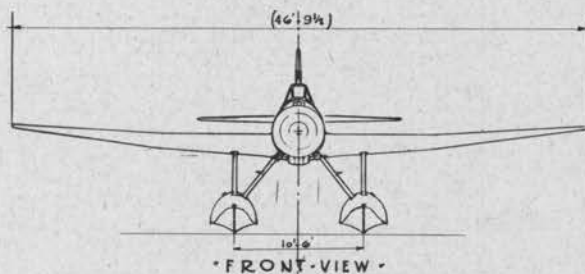
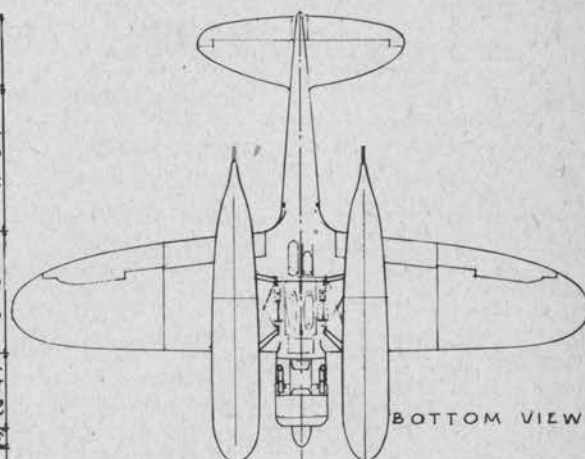
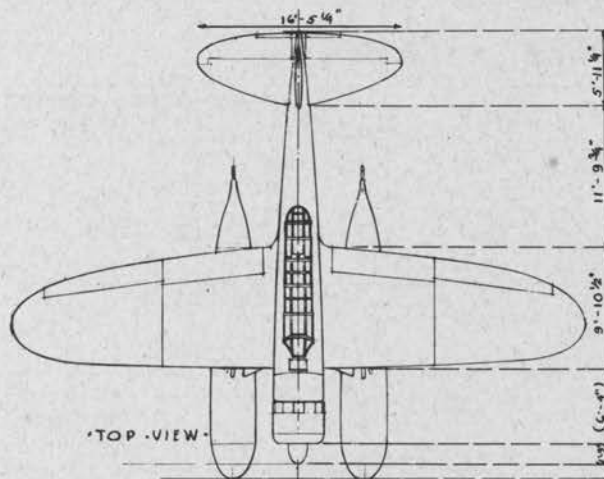
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## JAKE 11



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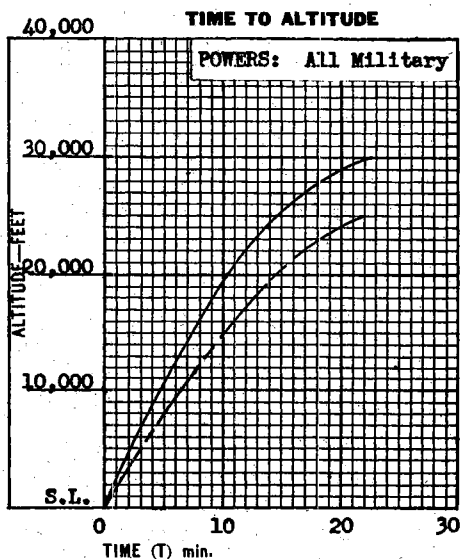
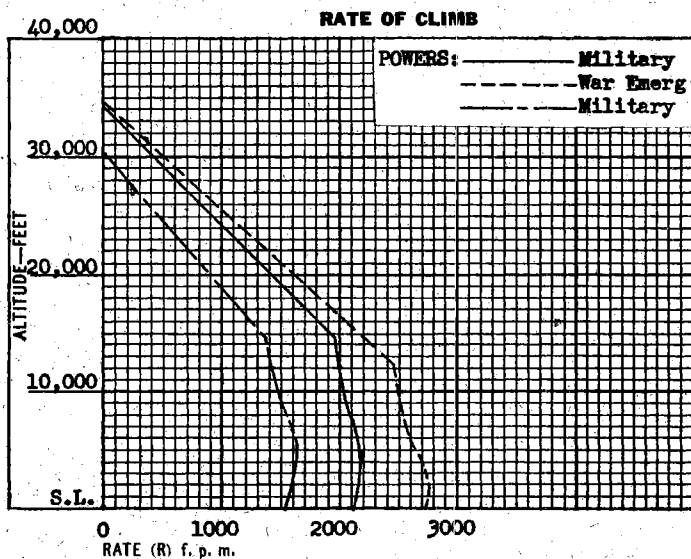
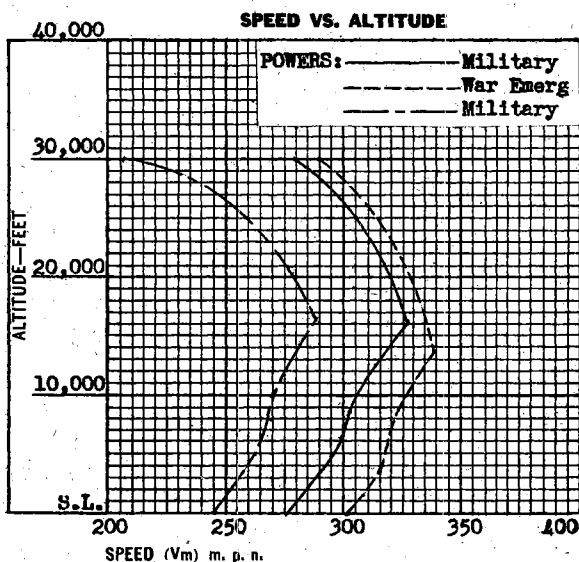
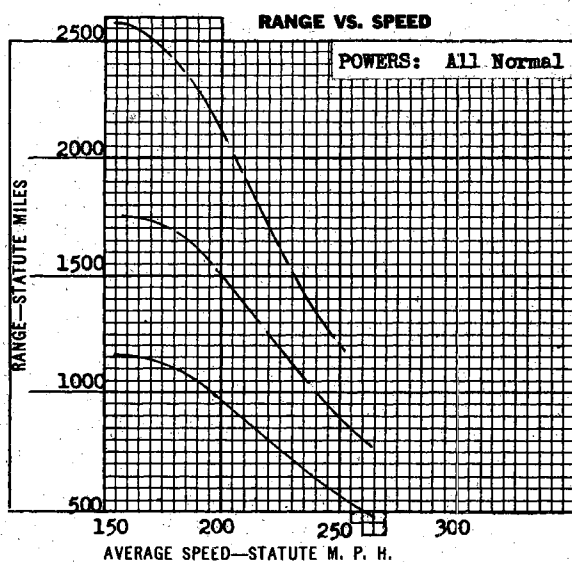
DATE December 1944

# UNCLASSIFIED

JULY 11

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL BOMBER	8059	1030	551
-----	NORMAL BOMBER	8059	1030	551
-----	BOMBER (Max. Bombs)	9264	1650	1103
-----	BOMBER (Max. Fuel)	9829	2616	551



DATE March 1945

UNCLASSIFIED

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## PERFORMANCE AND CHARACTERISTICS

JUDY 11

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	8059	1100
T.O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

## CLIMB—CEILING

@ 8059 lbs.	Feet	Min.
Rate @ S.L.	2110	1
Rate @ 4,900 ft.	2180	1
Time to 10,000'		4.7
Time to 20,000'		10.2
Service ceiling	33,100'	

## AIRCRAFT

Duty Dive Bombing; Reconnaissance
Designation (Suisei) Model 11 (Recce version is Type 2)
Description Low mid-wing Monoplane
Mfg. Aichi
Engines 1 Crew 2
Construction All Metal

## SPEED

@ 8059 lbs.	Mph.	Knts.	Altitude
Maximum WE	302	261	@ S. L.
Maximum WE	339	295	@ 13,800'
Cruising 75%	198	172	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	250 kg	550
Maximum	1	500 kg	1100

## ENGINES

	H. P.	Altitude
Take-off	1185	S.L.
Normal	815	1500'
Military	995	4900'
	955	14800'
War Emerg.	1205	1400'

## WEIGHTS

	Lbs.
Empty	5620
Gross	8059
Overload	9264

## FUEL

	U.S. gal.	Imp. gal.
Built-in	275	230
Internal (Removable)		
External (drop)	160	133
Maximum	435	363

Mfg. Aichi  
Model Atsuta 21  
Type Inverted 60° Vee  
Cylinders 12 Cooling Liquid  
Supercharger Single Speed Hydraulic  
Propeller 3 Blade Diam. 10.5' C.S.  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

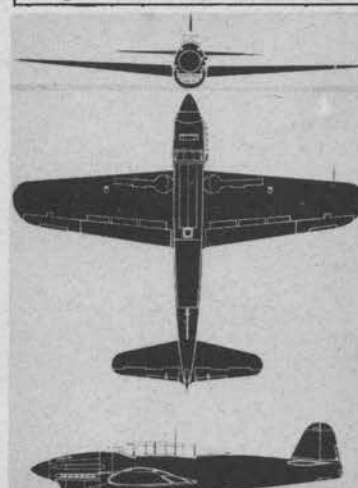
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2580	2238	155	135	1500	435	363	550	
At 75% Vmax.	2280	1978	191	165	1500	435	363	550	
Maximum range (normal fuel)	1155	1000	155	135	1500	172	143	550	
At 75% Vmax. Radius ( )	985	850	198	172	1500	172	143	550	
Radius ( )									

## DIMENSIONS

Span 37.8'	Length 33.6'
Height 10.4'	Wing area 254 sq.ft.

## GENERAL DATA

JUDY was first reported operational in September 1943. It is a high performance, two-place, carrier borne aircraft which is used for both dive bombing and reconnaissance. When on reconnaissance duties it is equipped with a "K-8" aerial camera with 25 or 50 cm lens.



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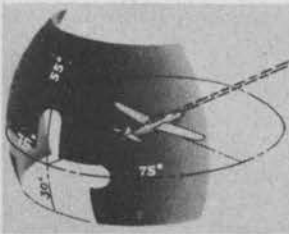
DATE March 1945

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JULY 11

## FIELDS OF FIRE



FORWARD GUNS "A"  
AND TOP GUN "B"  
¾-rear view from above  
TOP GUN "B" field  
of fire is provisional

## EXHAUST FLAME PATTERNS

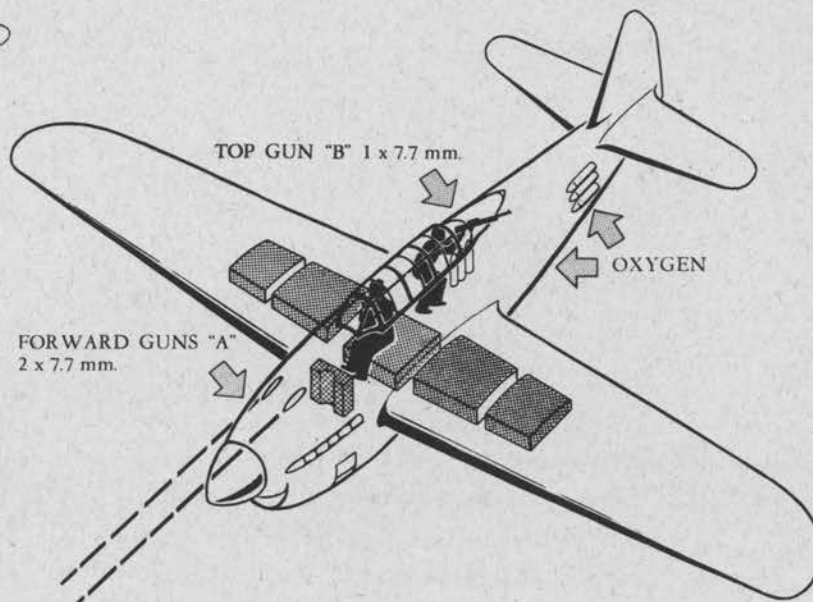


REAR VIEW

## VULNERABILITY



Auxiliary gas tanks  
Jettisonable



## LEGEND

Fuel tanks, unprotected

Fuel tanks, self-sealing

Oil tanks, unprotected

Oil tanks, self-sealing

FORWARD GUNS "A"  
2 x 7.7 mm.

TOP GUN "B" 1 x 7.7 mm.

OXYGEN

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7 mm	791	Fixed	Tail				
Top					Wing				
Rear	1	7.7 mm	1000	Flex.					
Cockpit									
Bottom									

## TACTICAL DATA

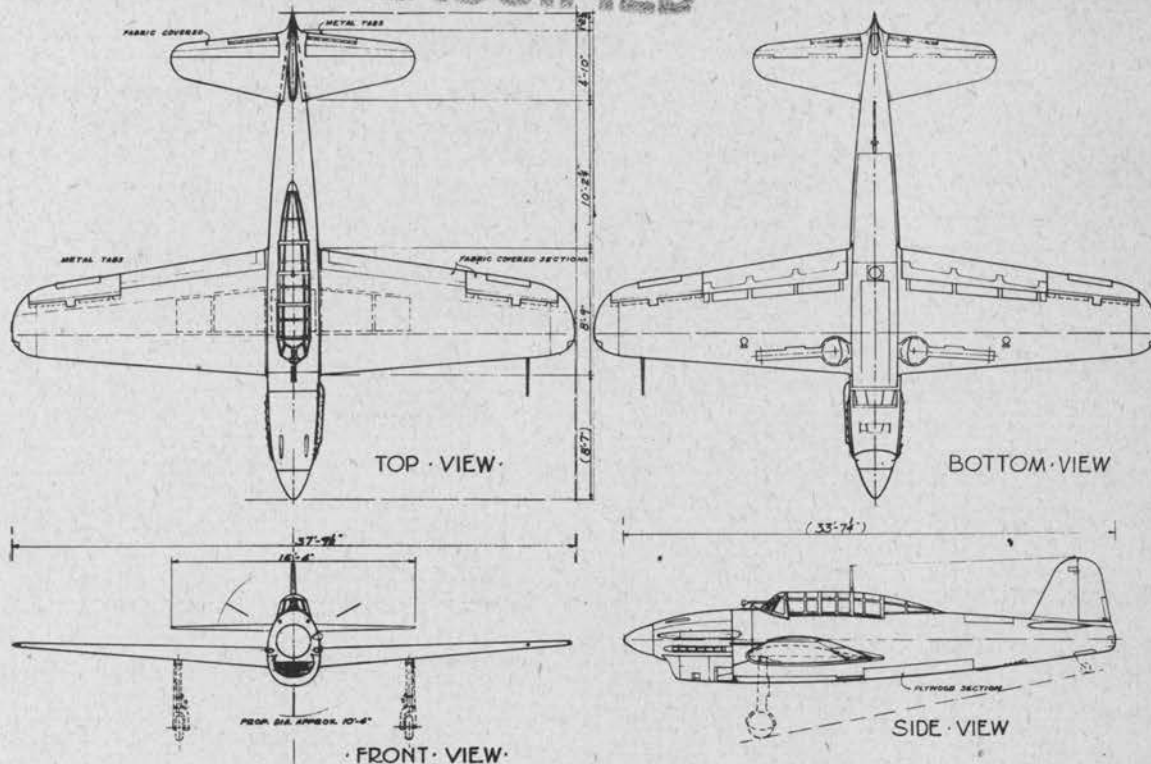
JUDY has neither pilot  
nor fuel tank protection.  
Clean and fast, JUDY will  
probably depend on speed for  
protection.

DATE December 1944

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JUDY 11



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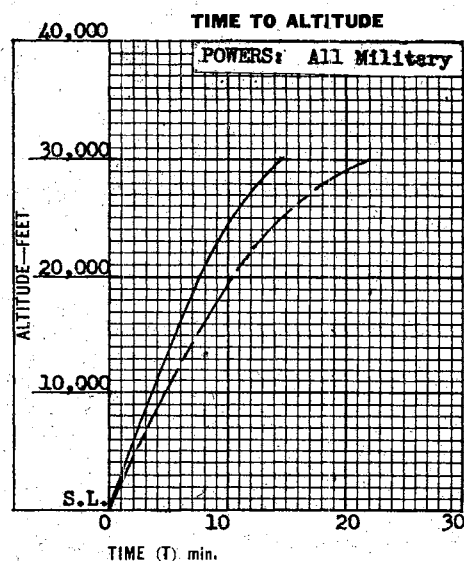
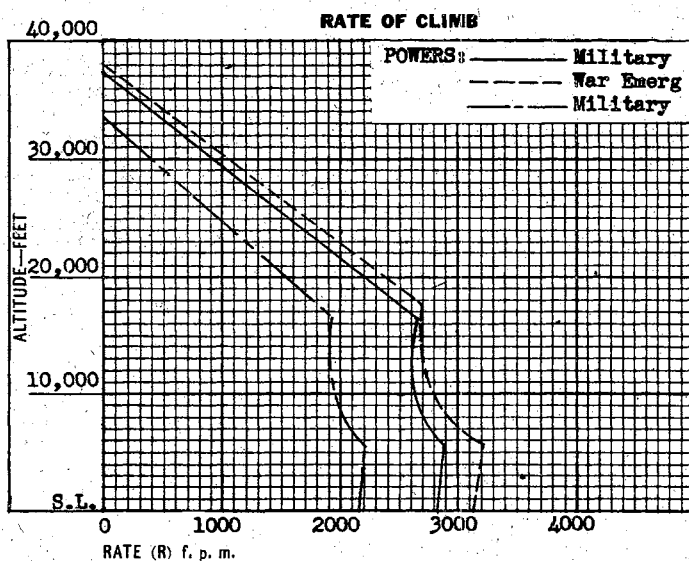
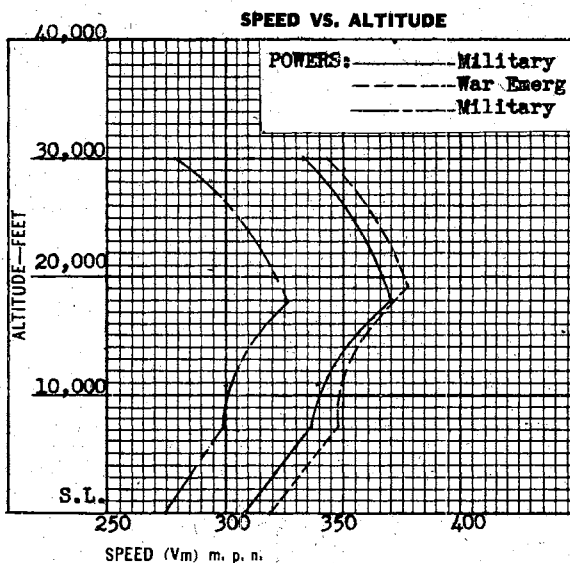
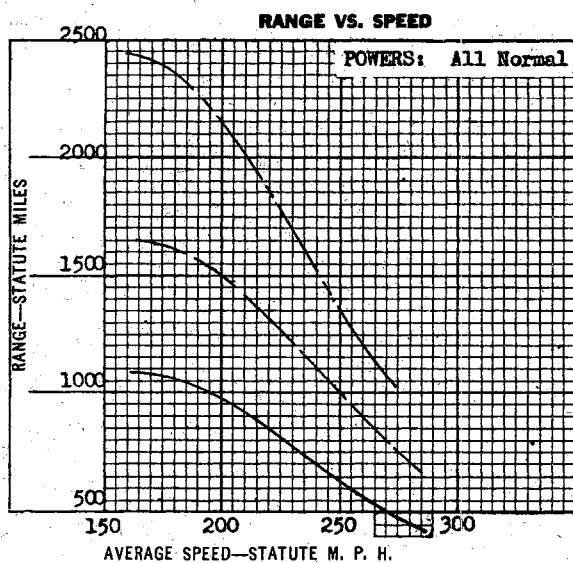
DATE March 1945

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JULY 12

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
_____	NORMAL BOMBER	8255	1030	551
-----	NORMAL BOMBER	8255	1030	551
_____	BOMBER (Max. Bombs)	9460	1650	1103
-----	BOMBER (Max. Fuel)	10,025	2616	551



DATE March 1945

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## PERFORMANCE

## AND

## CHARACTERISTICS

JUDY 12

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	8255	1200
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 8255	lbs.	Feet	Min.
Rate @ S.L.		2820	1
Rate @ 5500 ft.		2895	1
Time to 10,000'			3.6
Time to 20,000'			7.5
Service ceiling 36,400'			

## AIRCRAFT

Duty Dive Bombing  
Reconnaissance  
Designation (Suisel) Model 12  
(Recce Version is Type 2)  
Description Low mid-wing  
Monoplane  
Mfg. Aichi  
Engines 1 Crew 2  
Construction All Metal

## SPEED

@ 8255 lbs.	Mph.	Knts.	Altitude
Maximum WE	319	277	@ S. L.
Maximum WE	377	326	@ 19,300'
Cruising 75%	215	187	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	250 kg	550
or	2	100 kg	440
Maximum	1	500 kg	1100

## ENGINES

	H. P.	Altitude
W.E. Take-off	1380	S.L.
Normal	(1265	(S.L.
Military	(1265	(16,400'
War Emerg.	(1320	(5,750'
	1440	

## WEIGHTS

	Lbs.
Empty	5620
Gross	8255
Overload	10025

## FUEL

	U.S. gal.	Imp. gal.
Built-in	275	230
Internal (Removable)		
External (drop)	160	133
Maximum	435	363

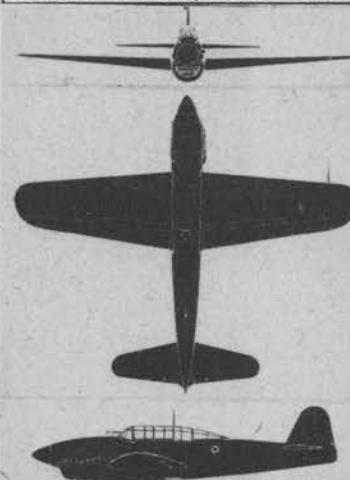
Mfg. Aichi  
Model Atsuta 31  
Type Inverted 60° Vee  
Cylinders 12 Cooling Liquid  
Supercharger 2 Speed  
Propeller 3-Blade Diam. 10.5'  
C.S.  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2445	2122	160	139	1500	435	363	550	
At 75% Vmax.	2070	1800	206	178	1500	435	363	550	
Maximum range (normal fuel)	1080	935	162	140	1500	172	143	550	
At 75% Vmax. Radius ( )	890	780	215	187	1500	172	143	550	
Radius ( )									

## DIMENSIONS

Span 37.8' Length 33.6'  
Height 10.4' Wing area 254 sq.ft.



## GENERAL DATA

In the "Type 2 Land Reconnaissance version (D4Y2-R), a 'K-8' camera with either 25 or 50 cm lens is installed in the after end of the rear cockpit.

Further information on JUDY 12 is contained in TAIC Summary No. 18 of December 1944.

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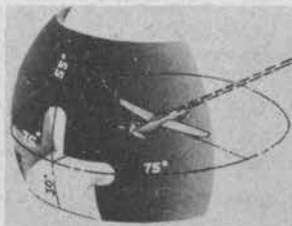
DATE March 1945

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JULY 12

## FIELDS OF FIRE



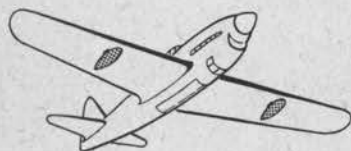
FORWARD GUNS "A"  
AND TOP GUN "B"  
¾-rear view from above  
TOP GUN "B" field  
of fire is provisional

## EXHAUST FLAME PATTERNS

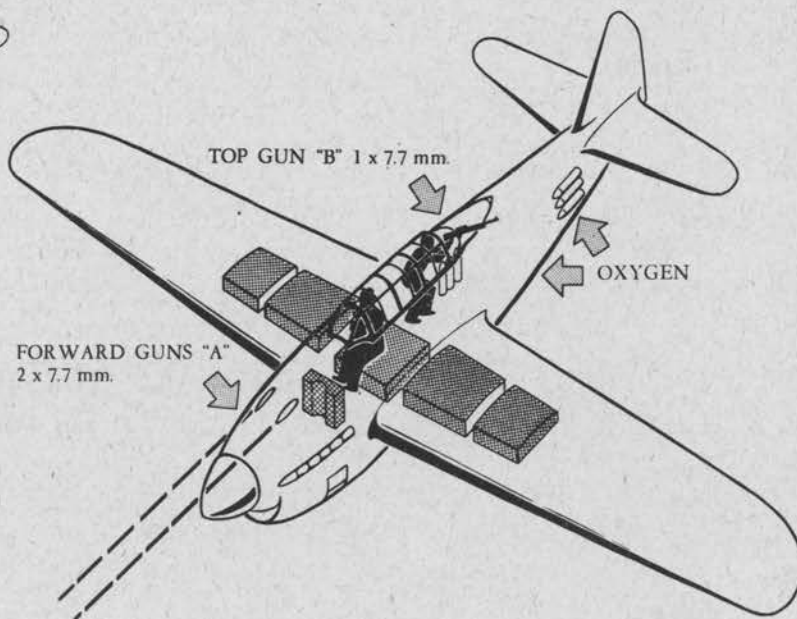


REAR VIEW

## VULNERABILITY

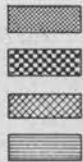


Auxiliary gas tanks  
Jettisonable



## LEGEND

Fuel tanks, unprotected  
Fuel tanks, self-sealing  
Oil tanks, unprotected  
Oil tanks, self-sealing



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7 mm		fixed	Tail				
Top rear Cockpit	1	7.7 mm		Flex.	Wing				
Bottom									

## TACTICAL DATA

Same as for JUDY 11 except  
for increased speed and  
climb.

DATE December 1944

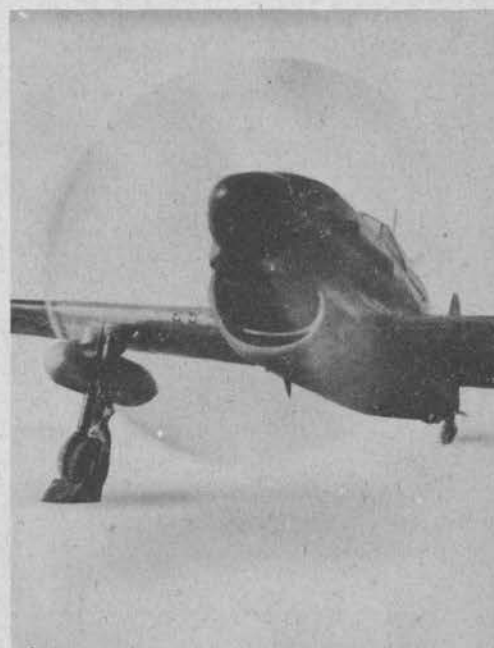
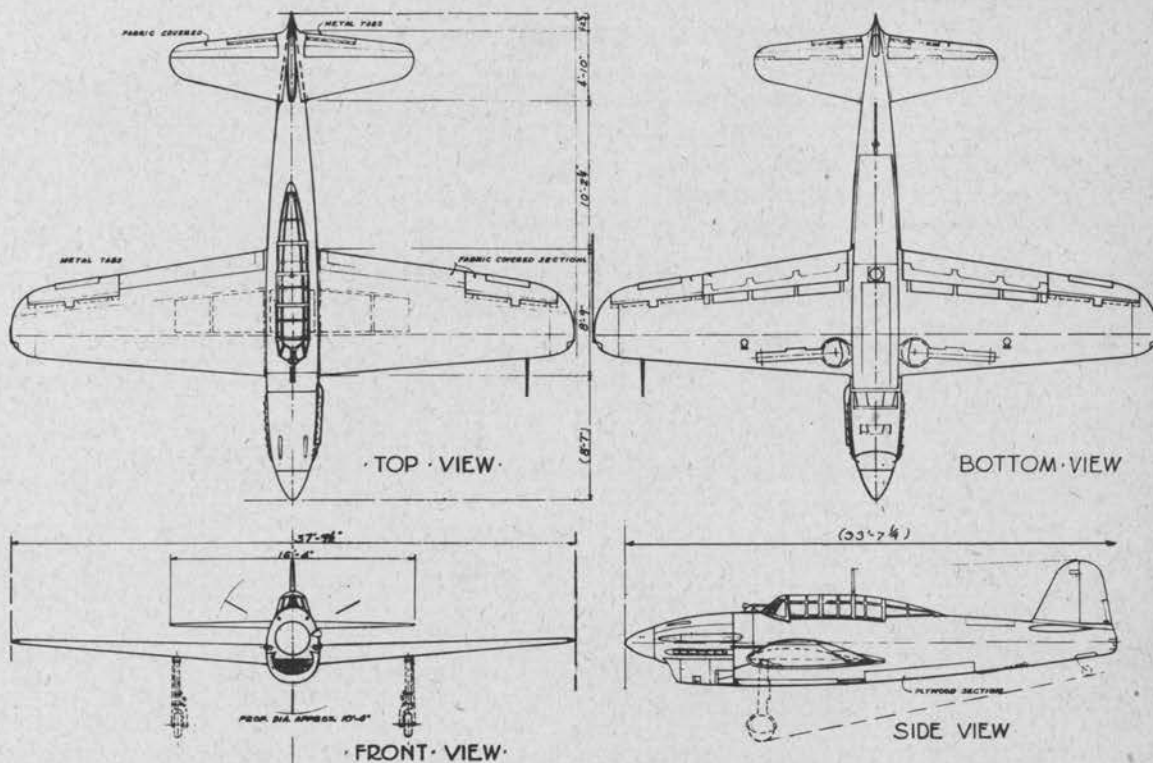
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## JUDY 12



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DATE March 1945

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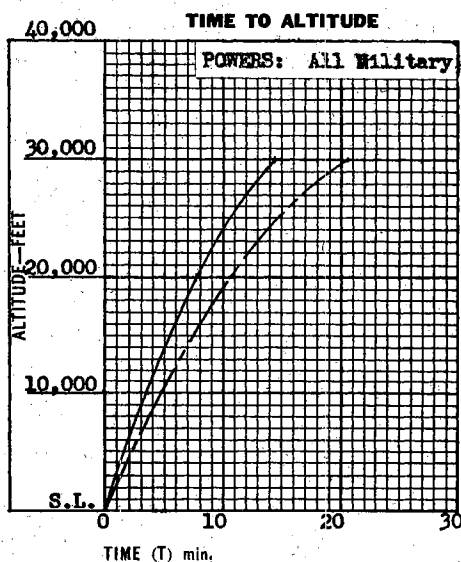
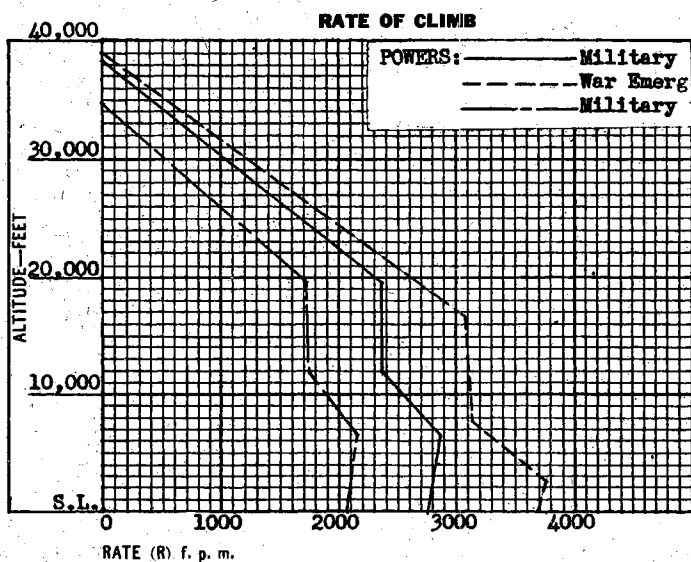
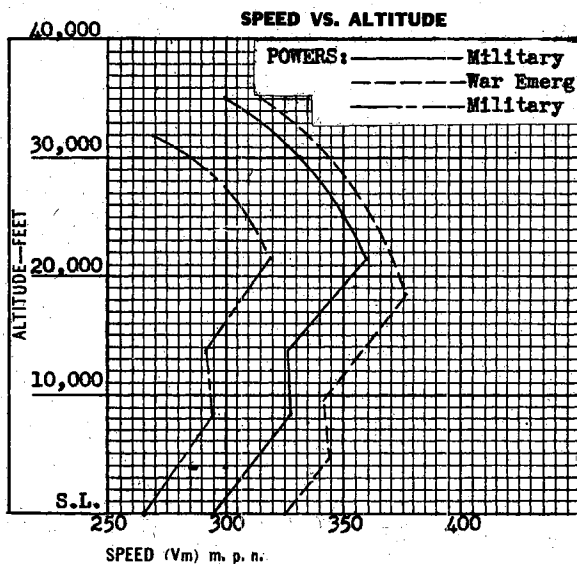
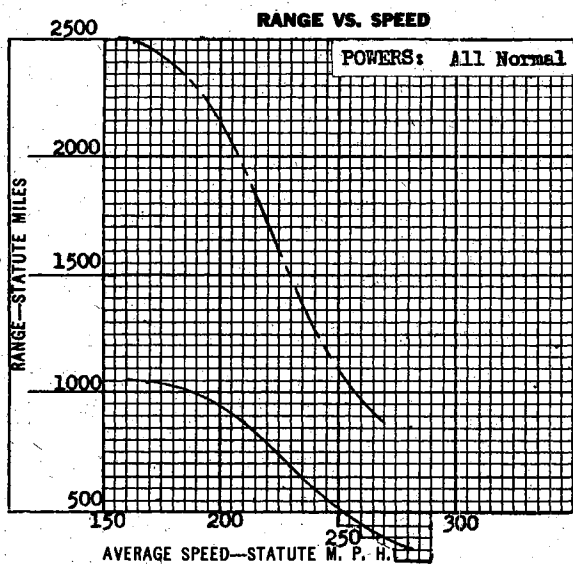


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JUDY 33

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL BOMBER	8080	1032	550
-----	NORMAL BOMBER	8080	1032	550
-----	OVERLOAD BOMBER	9855	2615	550



DATE March 1945

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## PERFORMANCE AND CHARACTERISTICS

JUDY 33

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	8080	1100
T.O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

## CLIMB—CEILING

@	8080 lbs.	Feet	Min.
Rate @ S.L.		2750	1
Rate @ 6500 ft.		2880	1
Time to 10,000'			3.6
Time to 20,000'			7.8
Service ceiling 38,300'			

## AIRCRAFT

Duty Dive Bombing;  
Reconnaissance  
Designation Suisei Model 33  
D4Y1-A  
Description Low mid-wing  
monoplane  
Mfg. Technical Air Arsenal  
Engines 1 Crew 2  
Construction All Metal

## SPEED

@ 8080 lbs.	Mph.	Knts.	Altitude
Maximum	325	282	@ S. L.
Maximum @ 75% Vmax.	376	326	@ 18,500'
Cruising	211	183	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	250 kg	550
Maximum	1	500 kg	1000

## ENGINES

	H. P.	Altitude
WE Take-off	1580	S.L.
Normal	1005	1,500'
Military	1280	6,500'
	1180	19,700'
War Emerg.	1620	2,800'

## WEIGHTS

	Lbs.
Empty	5450
Gross	8080
Overload	9855

## FUEL

	U.S. gal.	Imp. gal.
Built-in	275	230
Internal (Removable)		
External (drop)	160	133
Maximum	435	363

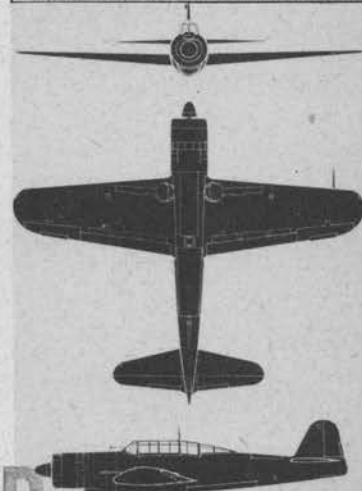
Mfg. Mitsubishi  
Model Kinsei 62 (Ha 33,  
Mod. 62)  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger 2 Speed  
Propeller 3 Blade Diam. 10.5'  
C.S.  
Fuel - Take-off 92 Cruising 92  
(Methanol used)

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2505	2173	157	136	1500	435	363	550	
At 75% Vmax.	2095	1820	203	176	1500	435	363	550	
Maximum range (normal fuel)	1055	914	161	139	1500	172	143	550	
At 75% Vmax.	870	758	211	183	1500	172	143	550	
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 37.8' Length 33.6'  
Height 10.4' Wing area 254 sq.ft.



## GENERAL DATA

JUDY 33 has a comparable performance to JUDY 12. It was probably developed because of maintenance difficulties encountered with the Atsuta in-line engine.

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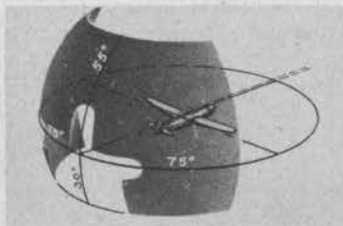
DATE March 1945

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JULY 33

## FIELDS OF FIRE



FORWARD GUNS "A"  
TOP GUN "B"

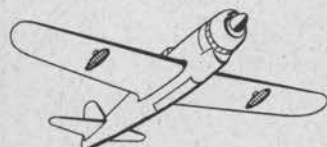
¾-rear view from above  
TOP GUN "B" field  
of fire is provisional

## EXHAUST FLAME PATTERNS

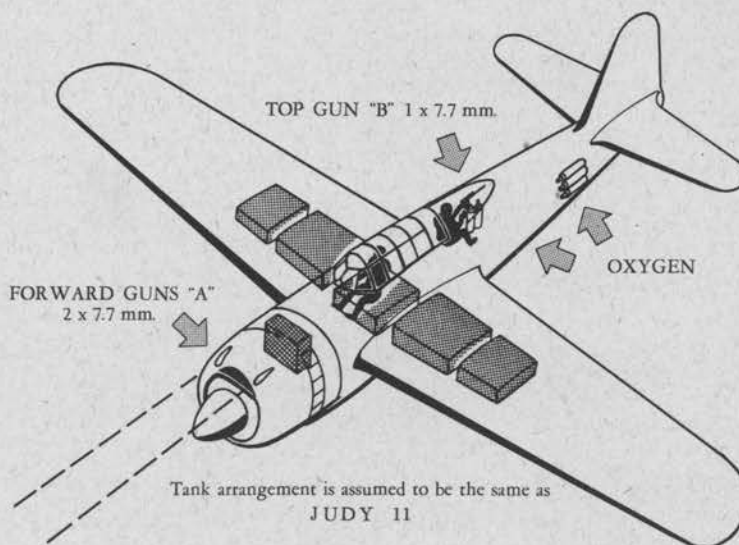


REAR VIEW

## VULNERABILITY



Auxiliary gas tanks  
Jettisonable



## LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Cowl	2	7.7 mm	400	Fixed	Tail				
Top	1	7.7 mm	582	Flex.	Wing				
Side									
Bottom									

## TACTICAL DATA

JUDY 33 has neither pilot  
nor fuel tank protection.

DATE March 1945

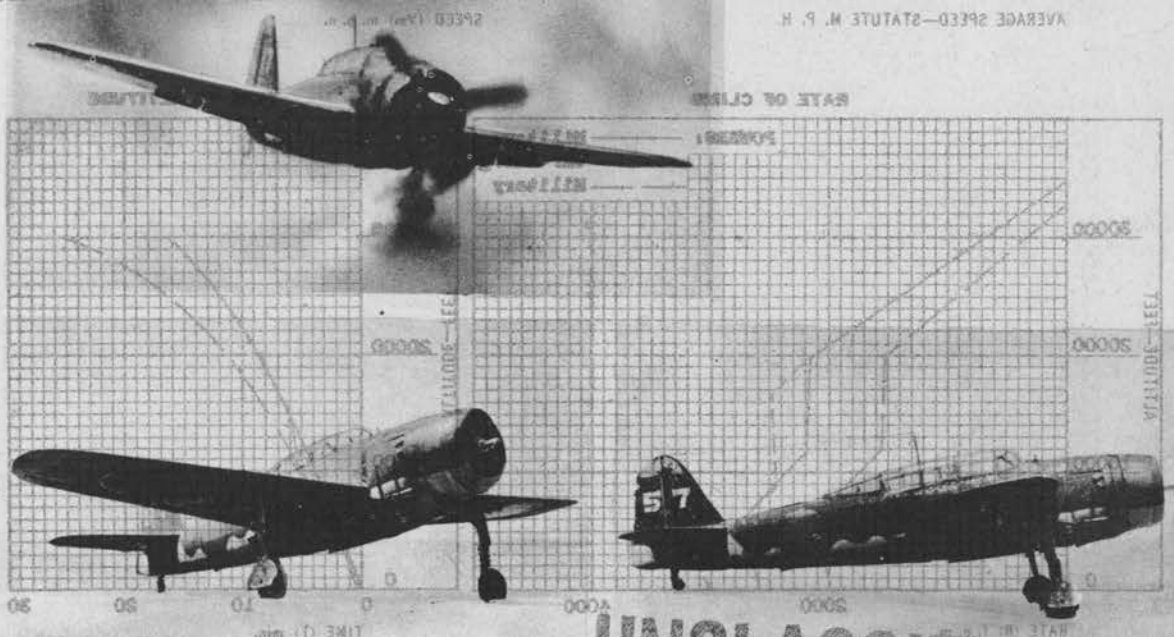
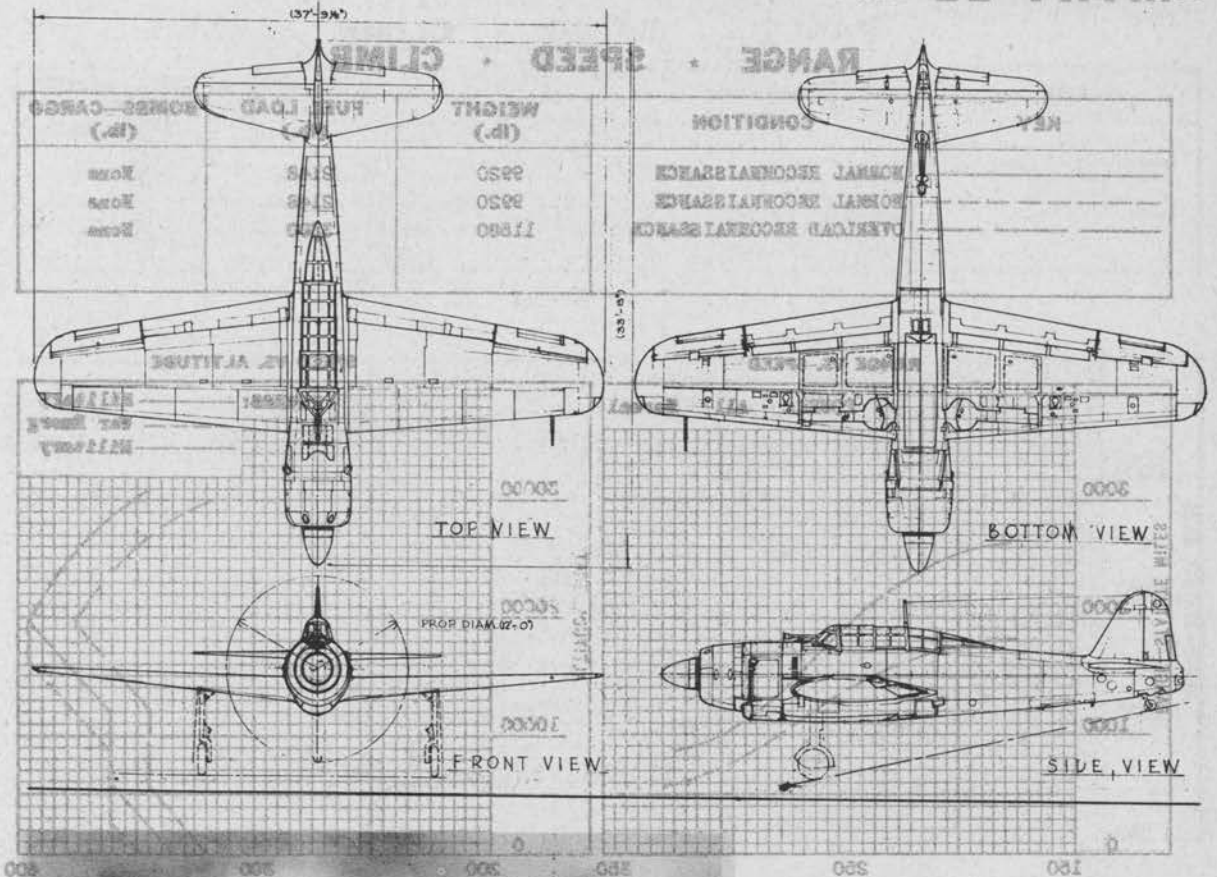
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1-206C-4

JULY 33



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DATE June 1945



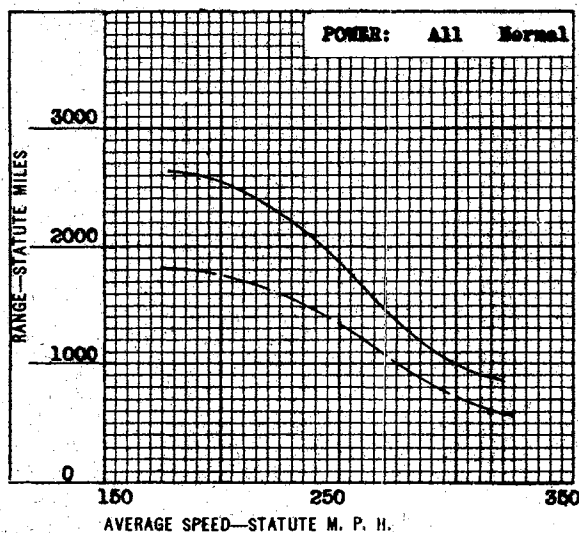
207A-1

UNCLASSIFIED  
MYRT 11

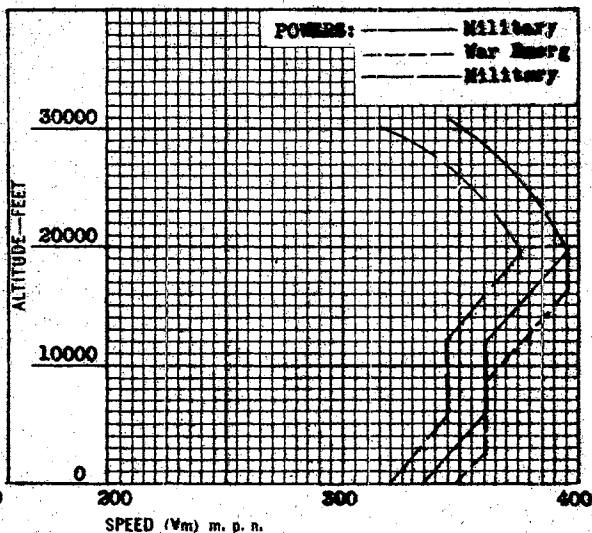
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL RECONNAISSANCE	9920	2148	None
-----	NORMAL RECONNAISSANCE	9920	2148	None
-----	OVERLOAD RECONNAISSANCE	11580	3300	None

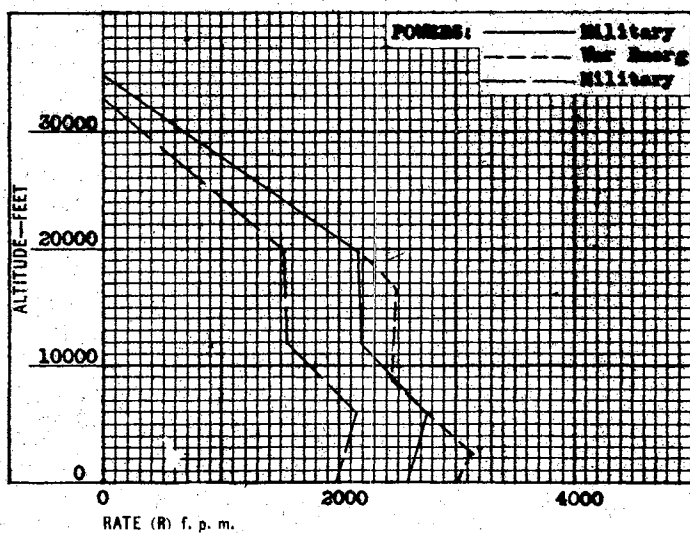
RANGE VS. SPEED



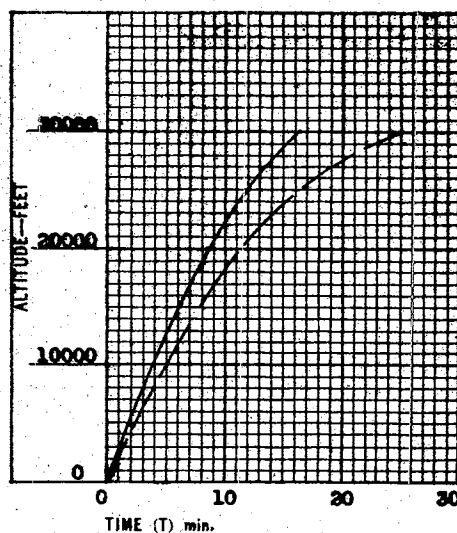
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



March 1945

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## PERFORMANCE

AND

## CHARACTERISTICS

MYRT 11

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	9920	2050
T.O. over 50' obstacle		
Landing over 50' obstacle		
* T.O. + 100%		

## CLIMB-CEILING

@ 9920	lbs.	Feet	Min.
Rate @ S.L.		2600	1
Rate @ 5900 ft.		2740	1
Time to 10,000'			3.8
Time to 20,000'			8.4
Service ceiling 34,100'			

## AIRCRAFT

Duty Reconnaissance
Designation (Saiun) Model 11
Description Low-wing Monoplane
Mfg. Nakajima
Engines 1 Crew 2-3
Construction All Metal

## SPEED

@ 9920 lbs.	Mph.	Knts.	Altitude
Maximum	347	214	@ S. L.
Maximum	396	344	@ 16,600'
Cruising			
Economical			

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum	1	torpedo	1760

## ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
WE		
Normal	1840	1500'
Military	1875	5900'
	1657	19700'
War Emerg.	2050	2500'

## WEIGHTS

	Lbs.
Empty	6340
Gross	9920
Overload	11580

## FUEL

	U.S. gal.	Imp. gal.
Built-in	358	297
Internal (Removable)		
External (drop)	192	160
Maximum	550	457

Mfg. Nakajima  
Model Homare 21  
Type Radial  
Cylinders 18 Cooling Air  
Supercharger 2 Speed  
Propeller 3-Blade Diam. 10.5'  
CS  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2640	2290	178	155	1500	550	457	None	None
	2105	1827	239	208	1500	550	457	None	None
Maximum range (normal fuel)	1815	1574	175	152	1500	358	297	None	None
Radius ( )	1410	1222	243	211	1500	358	297	None	None
Radius ( )									

## DIMENSIONS

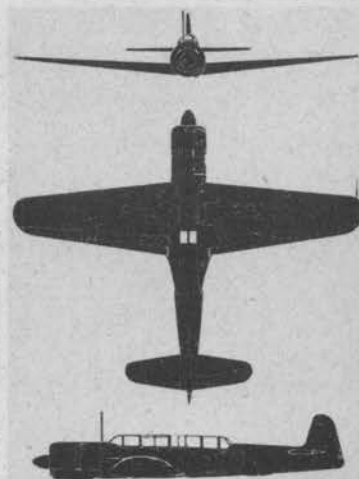
Span 41.1'	Length 36.5'
Height 12.9'	Wing area 274 sq. ft.

## GENERAL DATA

MYRT is equipped with one large vertically mounted camera and one hand camera for oblique shots.

This plane will possibly carry one 1760 lb. torpedo.

For further information on MYRT see TAIC Summary No. 24.



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DATE March 1945

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## EXHAUST FLAME PATTERNS



REAR VIEW

## FIELDS OF FIRE



TOP GUN "A" 1 x 7.9 mm.  
¾-rear view from above

## ARMOR PLATE

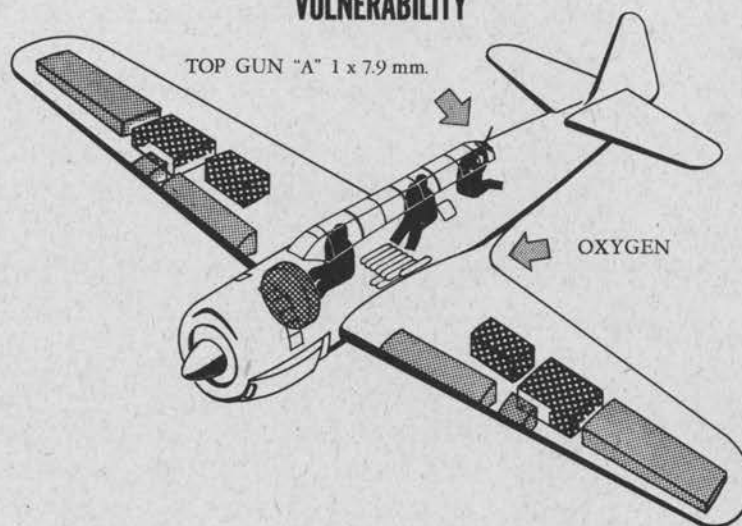


9.5 mm.

1

Viewed from rear

## VULNERABILITY



TOP GUN "A" 1 x 7.9 mm.

OXYGEN

## LEGEND

Fuel tanks, protected	
Fuel tanks, unprotected	
Oil tanks, protected	
Oil tanks, unprotected	

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Rear									
Cockpit	1	7.9 mm	450	Flexible					
Side									
Bottom									

## TACTICAL DATA

Armor plate behind pilot's back only. No protection for pilot's head.

Main wing tanks covered with self-sealing material. Other tanks are equipped with a CO<sub>2</sub> system.

DATE December 1944

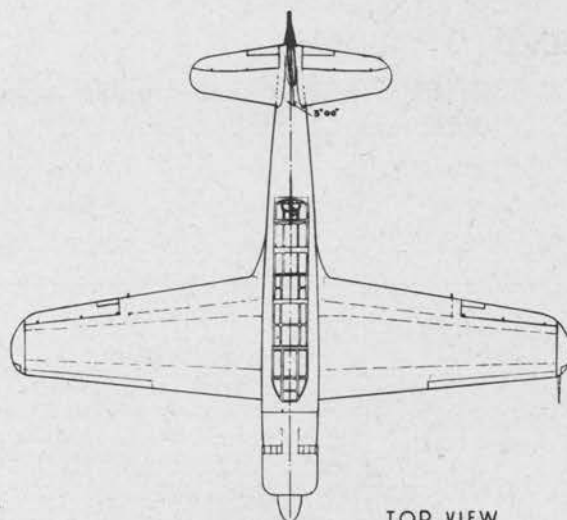
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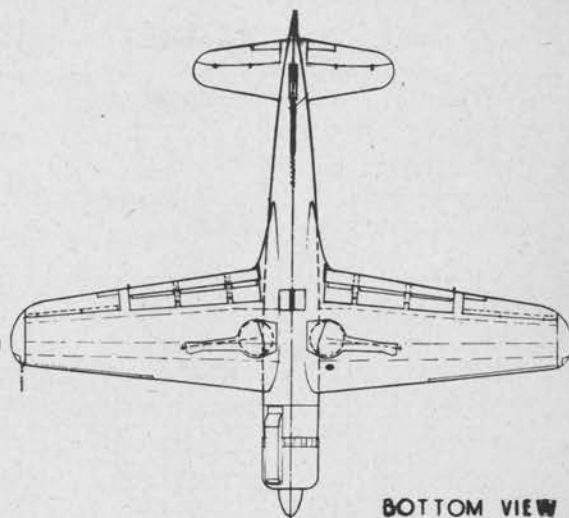
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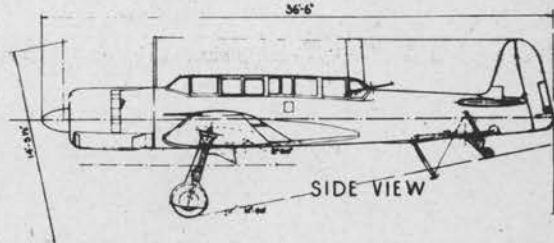
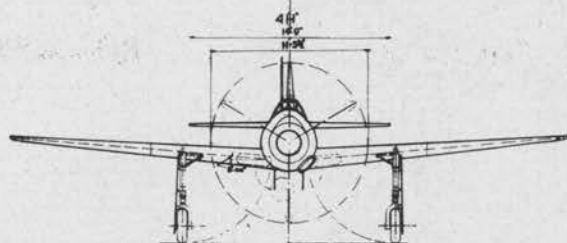
MYRT 11



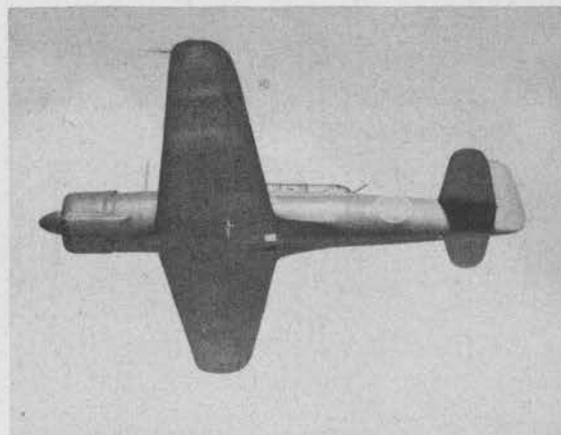
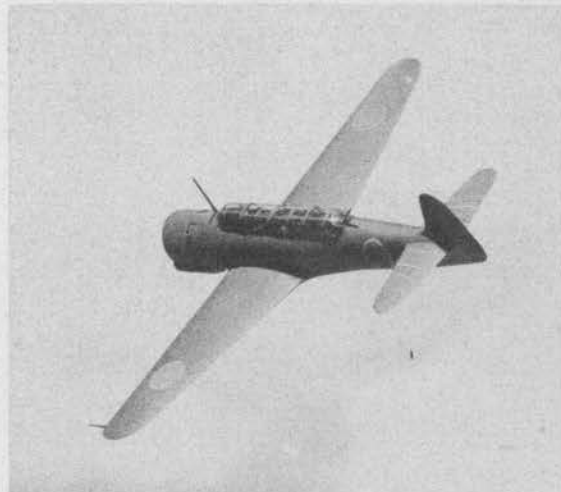
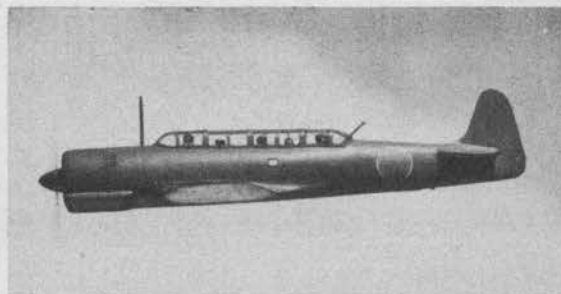
TOP VIEW



BOTTOM VIEW



SIDE VIEW



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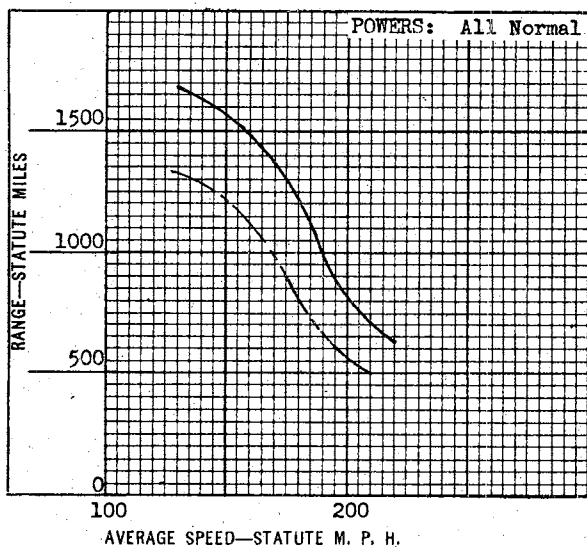
PAUL 11

UNCLASSIFIED

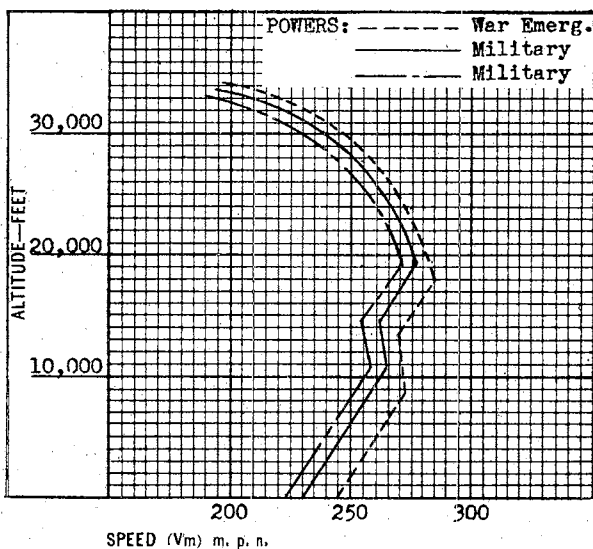
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	NORMAL	8792	1584	None
=====	OVERLOAD RECONNAISSANCE	9110	1902	None
-----	OVERLOAD BOMBER	9370	1584	550

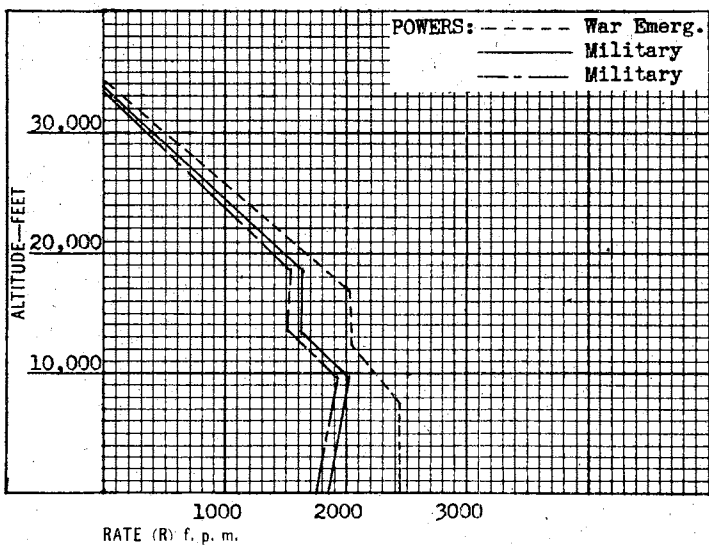
RANGE VS. SPEED



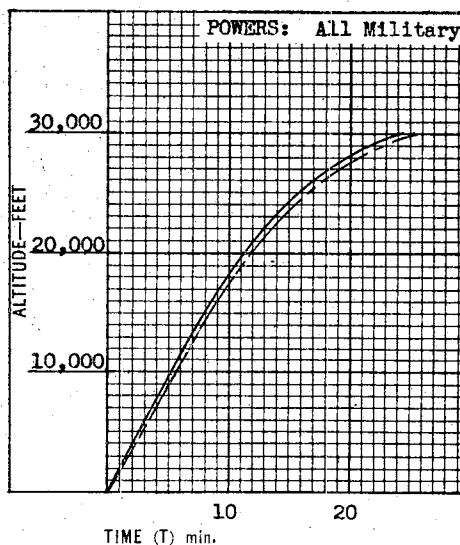
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE May 1945

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## PERFORMANCE AND CHARACTERISTICS

**PAUL 11**

### TAKE-OFF

	Load	Feet
T. O. calm		
T. O. 25 kt. wind		
T. O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 8792	lbs.	Feet	Min.
Rate @ S. L.		2440	1
Rate @ 16,900 ft.		2030	1
Time to 10,000			5.2
Time to 20,000			11.2
Service ceiling		33,350	

### AIRCRAFT

Duty	Recco & Dive Bombing
Designation	Zuiun Model 11
Description	Twin float low wing monoplane
Mfg.	Aichi
Engines	1
Crew	2
Construction	All metal; semi-monocoque fuselage, cantilever wing.

### SPEED

@ 8792 lbs.	Mph.	Knts.	Altitude
Maximum	245	212	@ S. L.
Maximum	285	246	@ 17,900'
Cruising - Combat	219	189	@ 1500'
Economical - Cruising	130	112	@ 1500'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	x 250kg Bomb	550
Maximum			

### ENGINES

	H. P.	Altitude
Take-off	1280	S.L.
Normal	895	1500'
Military	1185	9900'
	1080	18,700'
War Emerg.	1350	7700'
	1240	16,900'

### WEIGHTS

	Lbs.
Empty	
Gross	8792
Overload Recco Bomber	9110
	9370

### FUEL

	U. S. gal.	Imp. gal.
Built-in	264	220
In Floats	53	44
Internal (Removable)		
External (drop)		
Maximum	317	264

Mfg.	Mitsubishi
Model	Kinsei 54
Type	Radial
Cylinders	14
Cooling	Air
Supercharger	Two speed
Propeller	3 Blade
Diam.	10.83'
Fuel—Take-off	92
Cruising	92
or 87 plus ADI	

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range Recco (maximum fuel)	1690	1467	130	112	1500	317	264	None	None
Range @ Combat Cr	630	547	219	189	1500	317	264	None	None
Maximum range Overload Bomber	1320	1146	127	109	1500	264	220	550	None
Range @ Combat Cr Radius ( )	500	434	209	180	1500	264	220	550	None
Radius ( )									

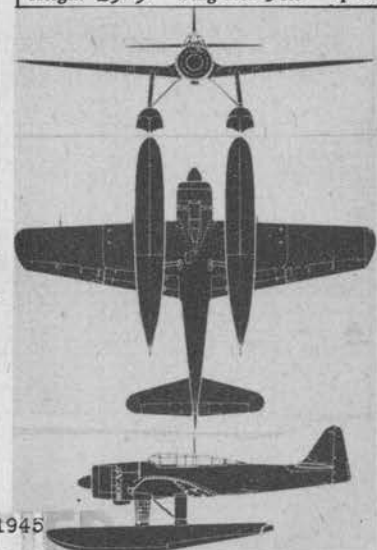
### DIMENSIONS

Span	42.0'	Length	35.6'
Height	15' 5"	Wing area	302 sq. ft.

### GENERAL DATA

Designed for both Reconnaissance and dive bombing, PAUL is fitted with double acting "swiss cheese" type dive brakes along the trailing edge of the front strut on each float.

Length of fuselage alone is 31.9'



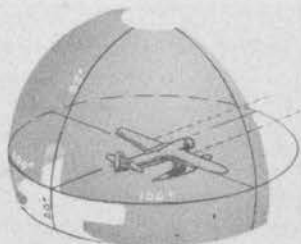
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DATE May 1945



PAUL 11

## FIELDS OF FIRE



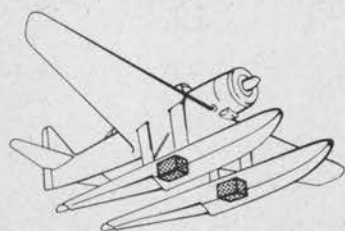
TOP GUN "A"  
FORWARD GUNS "B" AND "C"  
3/4-rear view from above

## EXHAUST FLAME PATTERNS

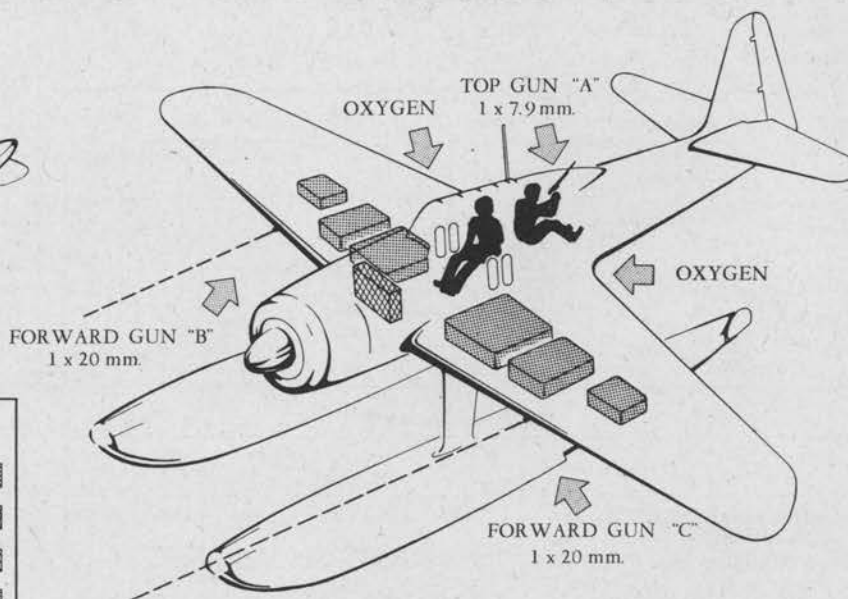


REAR VIEW

## VULNERABILITY



Fuel tanks in Floats



## LEGEND

Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	

## ARMAMENT

	No.	Size	Rds. Gun	Type
Wings	2	20 mm	200	Type 99 Mk.1 Fixed (Oerlikon), belt fed
Rear Cockpit	1	7.9mm	?	Type 1 Flexible (German MG 15)

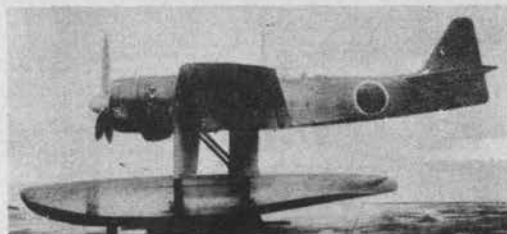
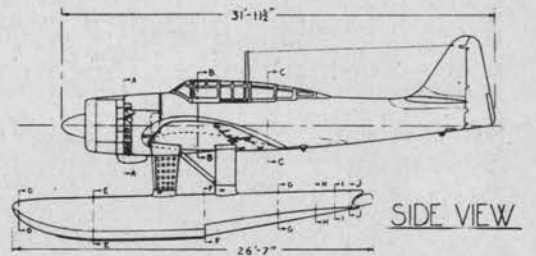
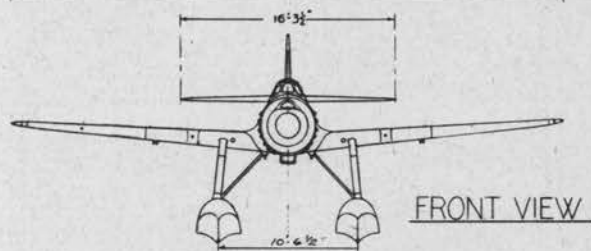
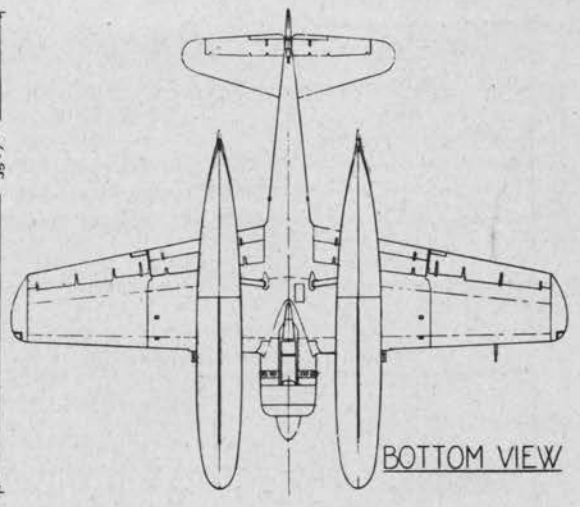
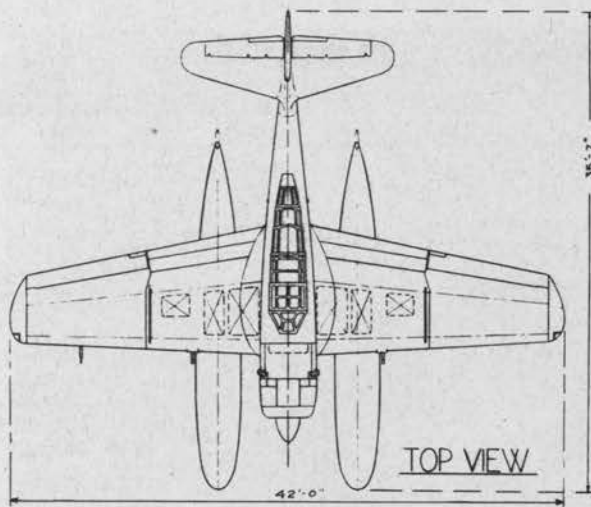
## TACTICAL DATA

A 13 mm flexible gun is expected to replace the 7.9mm gun.

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PAUL 11

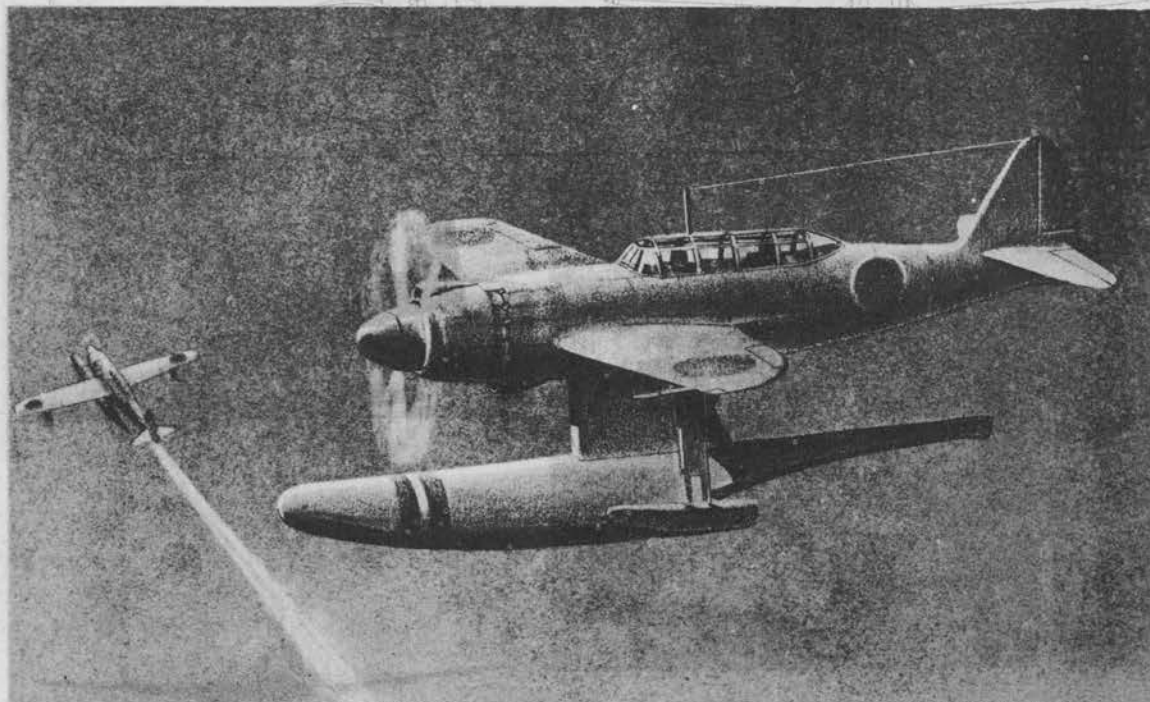
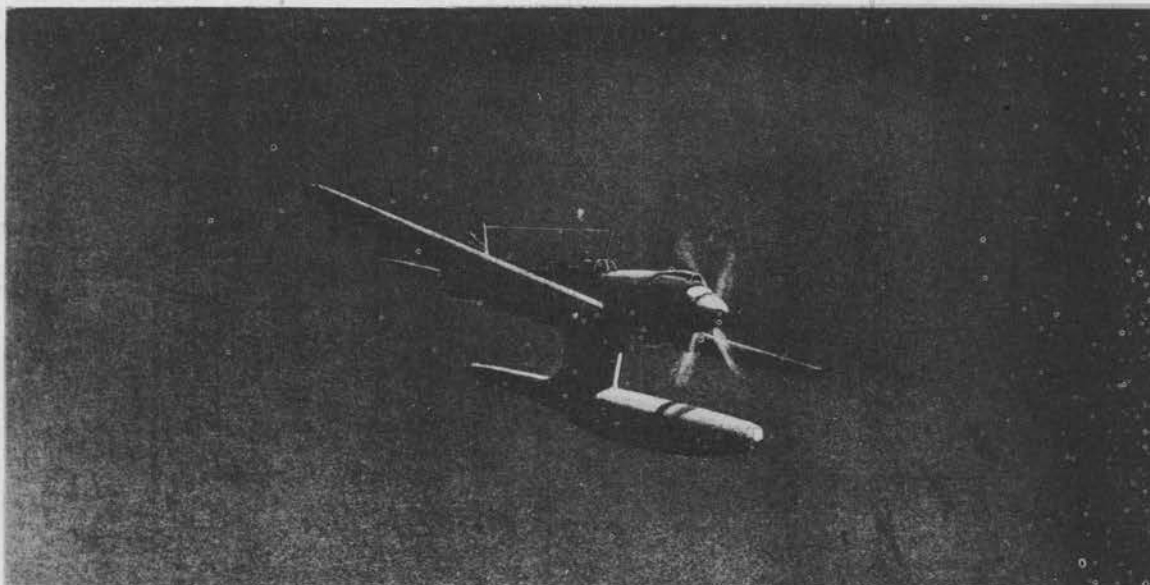


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## NORM 11



## ARMAMENT

## TACTICAL DATA

	No.	Size	Rds. Gun	Type
Rear Cockpit	1	7.7mm	?	Type 92 Flexible, Lewis type.



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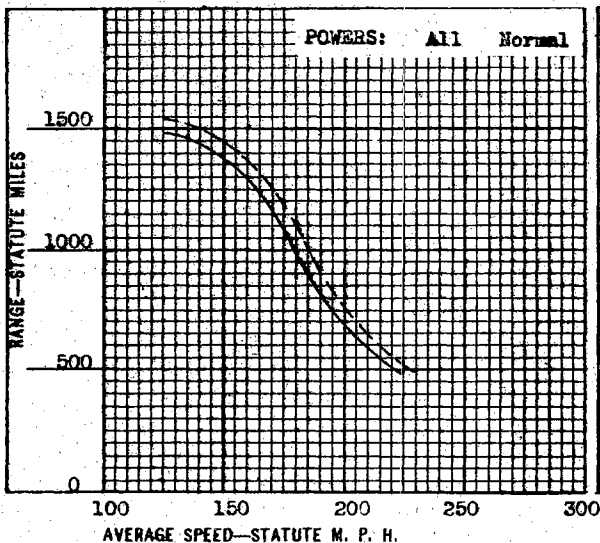


# SONIA 1

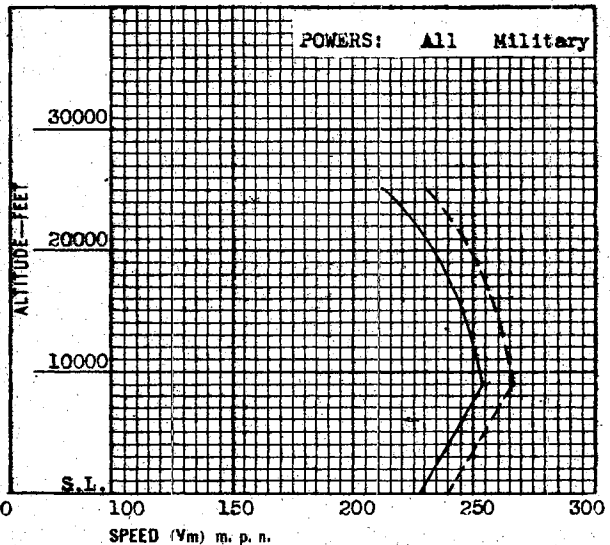
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	BOMBER	6495	1224	529
-----	SCOUT	5940	1224	None

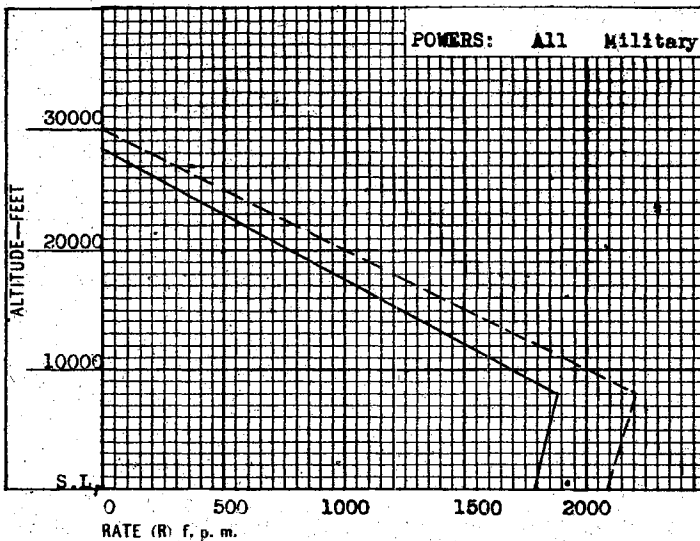
RANGE VS. SPEED



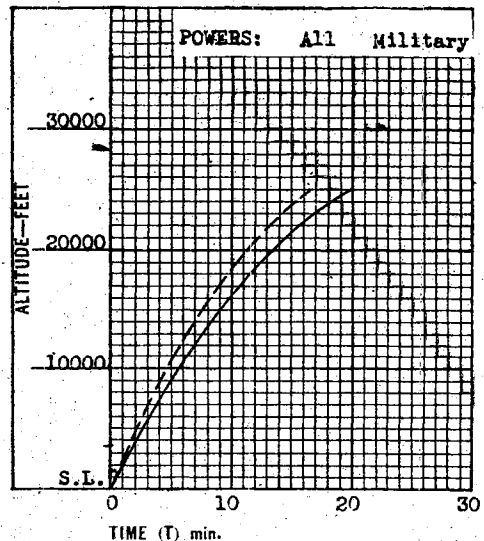
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



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## PERFORMANCE AND CHARACTERISTICS

## SONIA 1

## TAKE-OFF

	Load	Feet
T.O. calm	6495	682
T.O. 25 kt. wind	6495	276
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 6495	lbs.	Feet	Min.
Rate @ S.L.		1790	1
Rate @ 8,000 ft.		1885	1
Time to 10,000'			5.5
Time to 20,000'			13.4
Service ceiling 27,200'			

## AIRCRAFT

Duty Attack & Reconnaissance
Designation Type 99, Ki 51
Description Low-wing Fixed Landing Gear
Mfg. Mitsubishi
Engines 1 Crew 2
Construction

## SPEED

@ 6495	lbs.	Mph.	Knts.	Altitude
Maximum		228	197	@ S. L.
Maximum		254	220	@ 9,000'
Cruising 75%		168	145	1,500'
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	4	60 kg.	528
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	930	S.L.
Normal		
Military	850	S.L.
	910	8,000'
War Emerg.	990	7,500'

## WEIGHTS

	Lbs.
Empty	4125
Gross (Reconnaissance Bomber)	5940
Overload	6495

## FUEL

	U.S. gal.	Imp. gal.
Built-in	204	169
Internal (Removable)		
External (drop)		
Maximum	204	169

Mfg. Mitsubishi

Model Type 99, Model 2  
900 h.p.

Type Radial

Cylinders 14 Cooling Air

Supercharger Single Speed

Propeller 3 Blade Diam. 9.7'

Fuel - Take-off C.S. Cruising

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range Reconnaissance	1540	1337	126	109	1500	204	169	None	None
At 75% Vmax.	1225	1064	172	149	1500	204	169	None	None
Maximum range Bomber	1445	1263	125	108	1500	204	169	528	None
At 75% Vmax.	1180	1024	168	145	1500	204	169	528	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 39.8'	Length 27.8'
Height	Wing area 260 sq.ft.

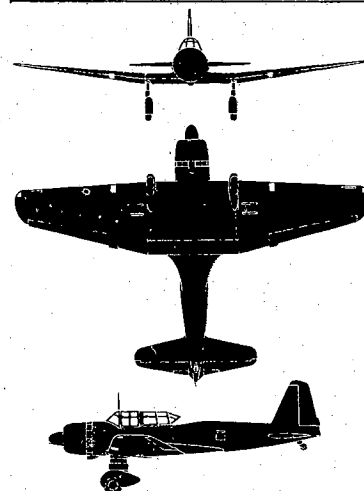
## GENERAL DATA

Although obsolescent, SONIA is still reported in sightings.

Maximum ranges are given both in reconnaissance and bomber conditions. SONIA may carry a 30-40 gallon jettisonable belly tank.

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**SONIA 1**

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Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gm	Type		No.	Size	Rds. Gm	Type
Forward					Tail				
Top					Wing	2	7.7 mm		Fixed
Rear	1	7.7 mm		Flexible					
Cockpit									
Side									
Bottom									

**TACTICAL DATA**

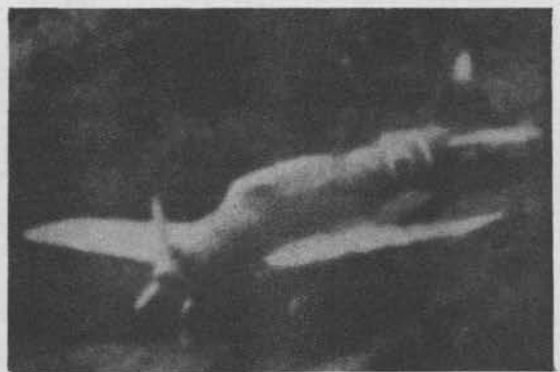
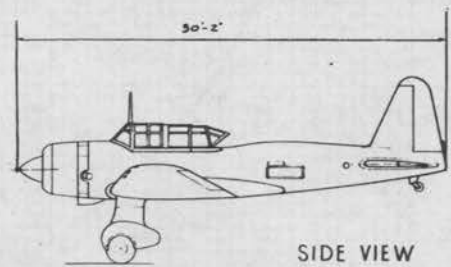
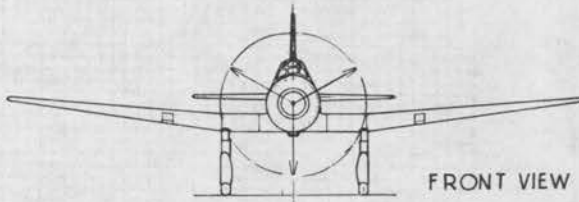
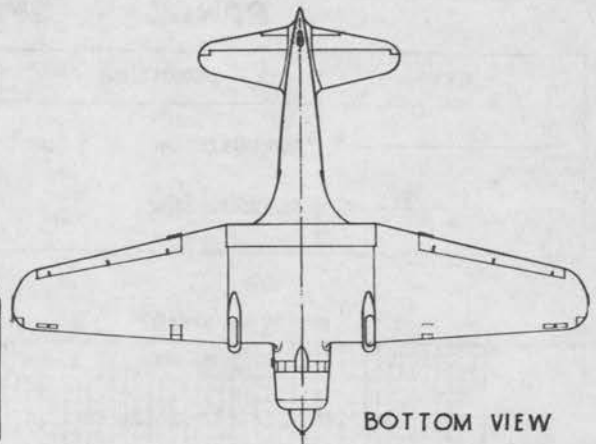
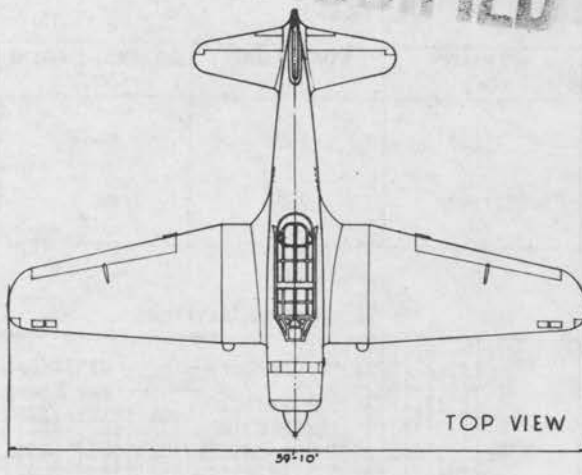
SONIA is known to have carried armor under the forward fuselage for the protection of fuel and oil lines, oil tank, and the pilot, probably only in attack version.

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# SONIA 1



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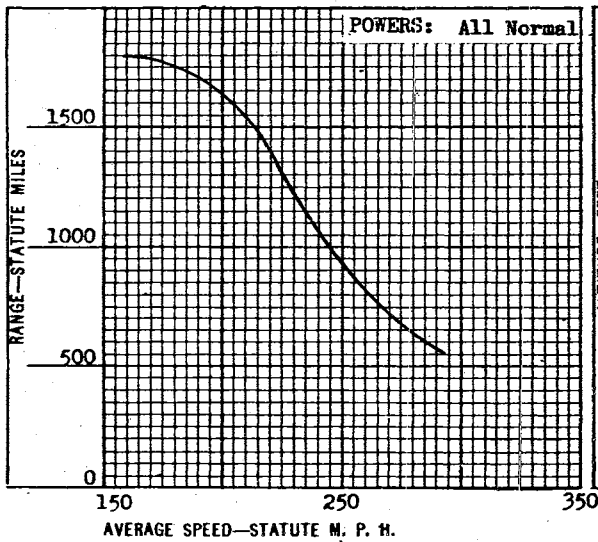


# DINAH 2

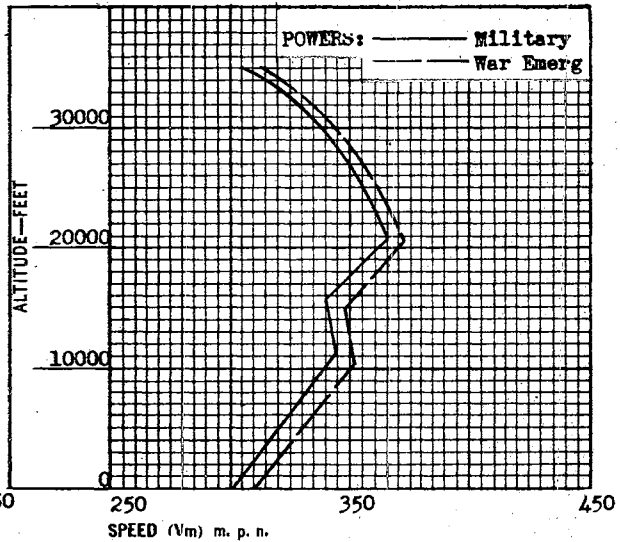
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	RECONNAISSANCE	11882	2628	None
-----	RECONNAISSANCE	11882	2628	None

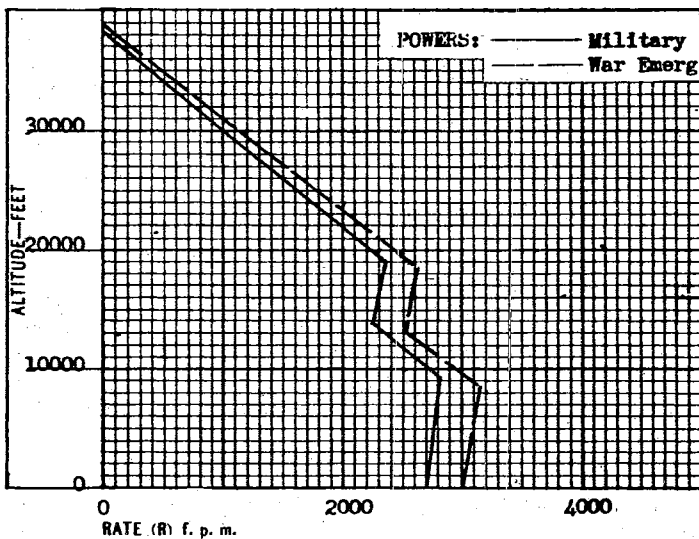
RANGE VS. SPEED



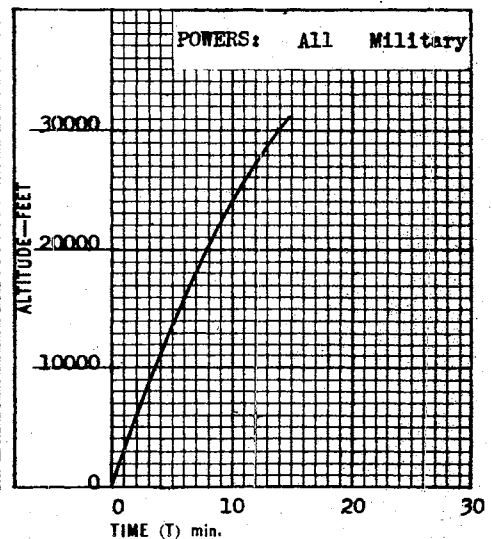
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



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## PERFORMANCE AND CHARACTERISTICS

## DINAH 2

## TAKE-OFF

	Load	Feet
T.O. calm	11,882	656
T.O. 25 kt. wind	11,882	299
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@	lbs.	Feet	Min.
Rate @ S.L.		2700	1
War Emerg.		3010	1
Rate @ 19,000 ft.		2355	1
W. E. @ 18,500'		2630	1
Time to 10,000'			3.6
Time to 20,000'			7.9
Service ceiling		37,400'	

## AIRCRAFT

Duty Reconnaissance
Designation Type 100, Model 2
Description Low-wing monoplane
Mfg. Mitsubishi
Engines 2 Crew 2
Construction All metal

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum	301	261		@ S. L.
War Emerg.	310	269		@ S. L.
Maximum	365	317		@ 21,000'
War Emerg.	372	322		20,500'
Cruising 75%	219	190		1,500'
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal		None	
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1065	S. L.
W. E.	1135	8,500'
Normal	1020	18,000'
Military	1040	9,200'
War Emerg.	935	19,000'

## WEIGHTS

	Lbs.
Empty	8,058
Gross	11,882
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	438	364
Internal (Removable)		
External (drop)		
Maximum	438	364

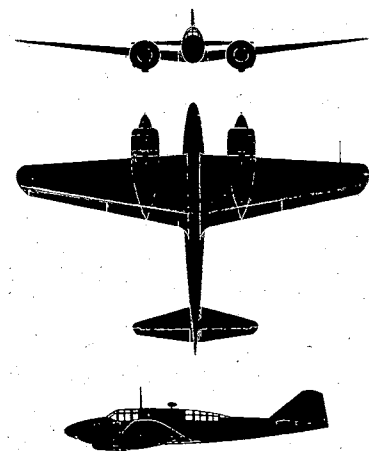
Mfg. Mitsubishi
Model Type 1, 1050 HP
Type Radial
Cylinders 14 Cooling Air
Supercharger 2-speed
Propeller 3-Blade C.S. Diam. 9.8'
Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)	1795	1555	158	136	1500	438	364	None	None
@ 75% VM	1405	1220	219	190	1500	438	364	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 48.3'	Length 36.3'
Height	Wing area 352 sq. ft.



## GENERAL DATA

Speed and climb figures are for military power except where indicated as War Emergency.

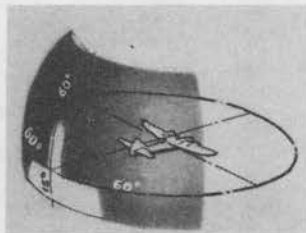
Armament and appearance of DINAH 2 are equivalent to DINAH 3.

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## DINAH 2

## FIELDS OF FIRE



TOP GUN "A" 1 x 7.7 mm.  
¾-rear view from above

## EXHAUST FLAME PATTERNS

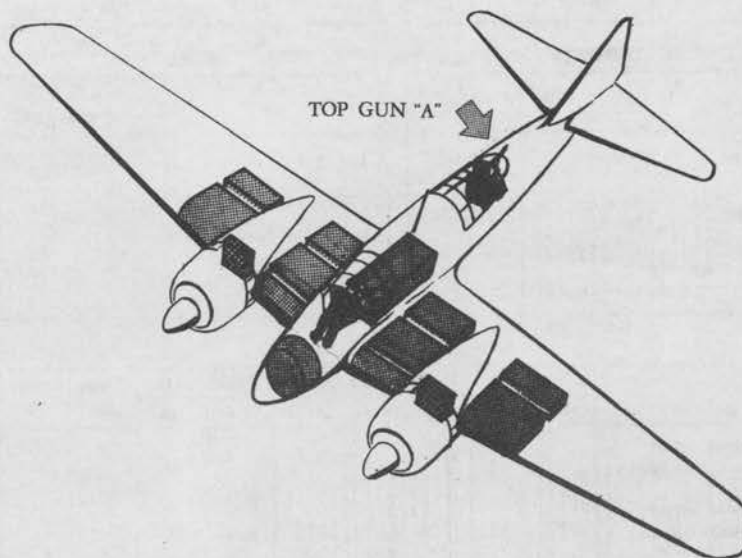


REAR VIEW

## VULNERABILITY

No information on other guns

LEGEND	
Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	



## ARMAMENT

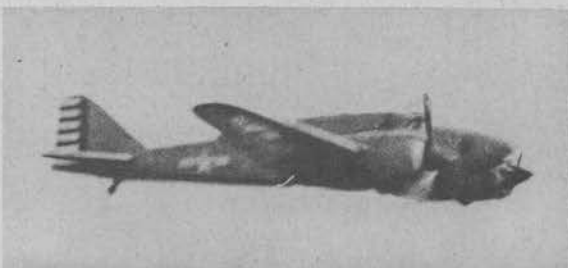
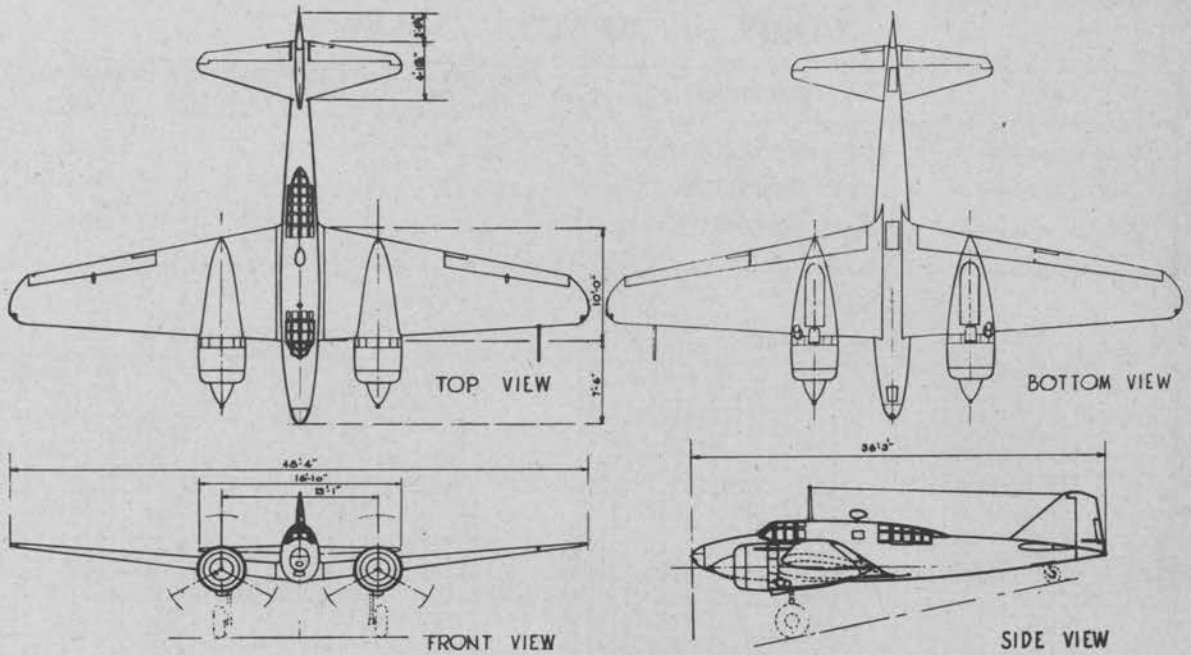
	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Rear									
Cockpit	1	7.7 mm		Flex.					
Side									
Bottom									

## TACTICAL DATA

Maximum armament recovered has been 1 x 7.7 mm top rear free gun. One report indicated 2 x 7.7 free guns. Has used grenade discharge device.

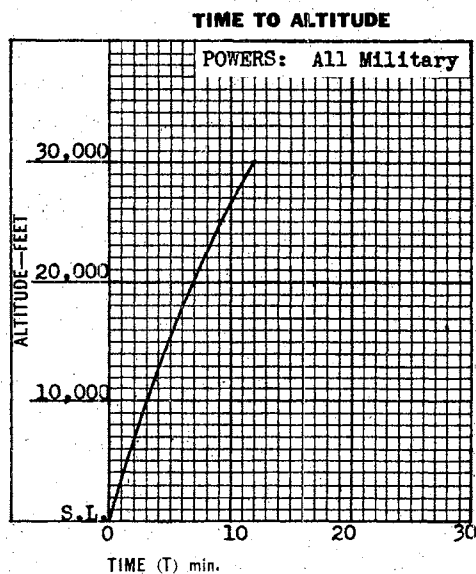
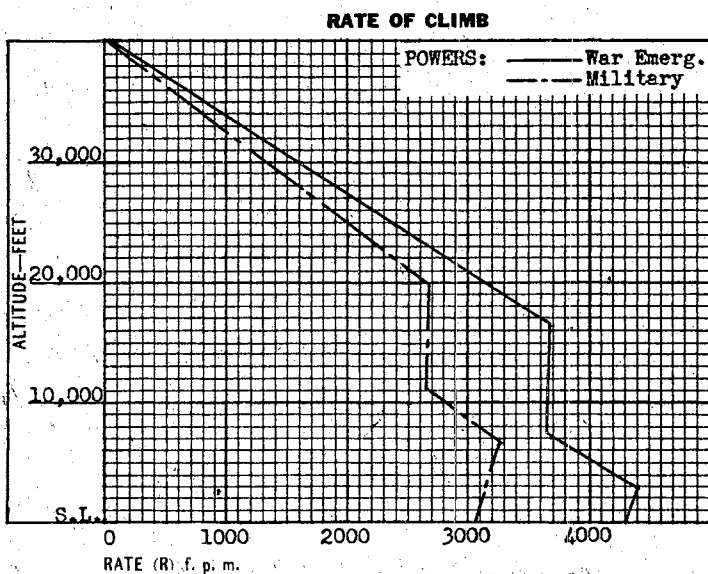
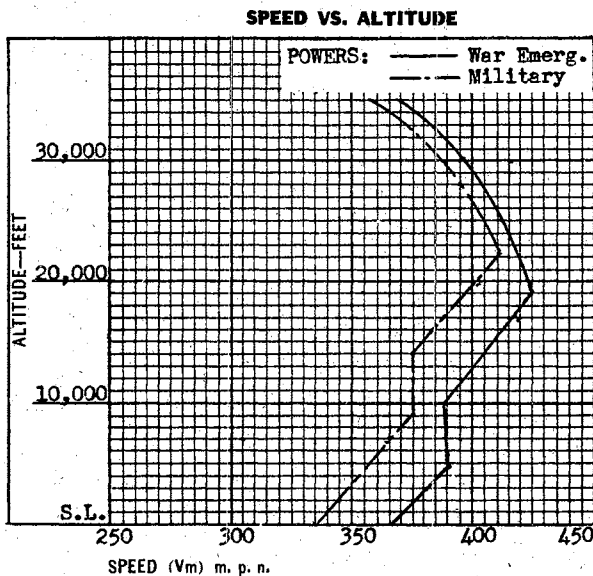
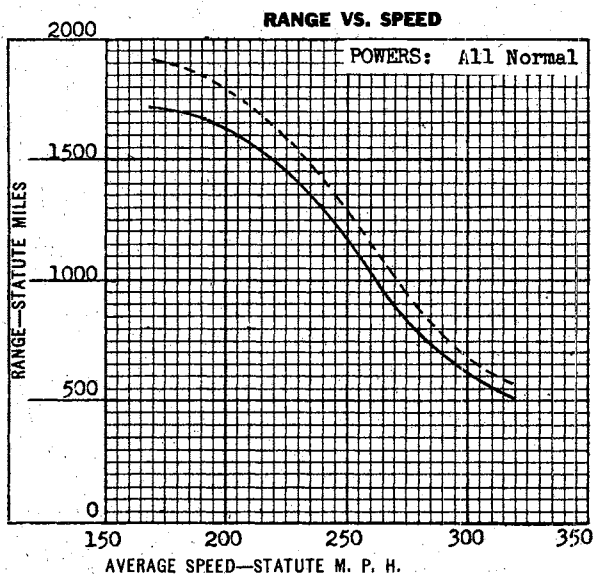
DATE December 1944

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**RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL RECONNAISSANCE	12,270	2590	None
-----	NORMAL RECONNAISSANCE	12,270	2590	None
-----	OVERLOAD RECONNAISSANCE	12,575	2895	None



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253B-2

## PERFORMANCE

AND

## CHARACTERISTICS

DINAH 3

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	12,405	1460
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 12,405 lbs.	Feet	Min.
Rate @ S. L.	4292	1
Rate @ 16,700 ft.	3630	1
Time to 11,700'		3.8
Time to 19,700'		6.8
Service ceiling 40,600'		

## AIRCRAFT

Duty Reconnaissance
Designation Type 100, Model 3
Description Low-wing monoplane
Mfg. Mitsubishi
Engines 2 Crew 2
Construction All metal; semi-monocoque fuselage, cantilever wing.

## SPEED

@ 12,405 lbs.	Mph.	Knts.	Altitude
Maximum	366.5	318	@ S. L.
Maximum	419.6	364	@ 16,700'
Cruising - Combat	318	276	@ 1500'
Economical - Cruising	168	146	@ 1500'

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	None		
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1580	S.L.
Normal	1100	9100
	990	21,500
	1280	6600
Military	1185	19,700
War Emerg.	1620	2800
	1490	16,700

## WEIGHTS

	Lbs.
Empty	8215
Gross	12,405
Overload	12,575

## FUEL

	U. S. gal.	Imp. gal.
Built-in	508	423
Internal (Removable)		
External (drop)		
Maximum	508	423

Mfg. Mitsubishi
Model Ha 112 Model 2
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 Bl C.S. Diam. 9.68'
Fuel-Take-off 92 Cruising 92 plus ADI

## RANGE AND RANGE

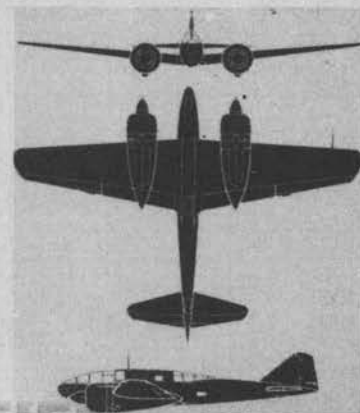
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1910	1659	170	148	1500	508	423	None	None
Range @ Combat Cr	572	497	318	276	1500	508	423	None	None
Maximum range (normal fuel)	1713	1488	168	146	1500	454	378	None	None
Range @ Combat Cr	512	445	318	276	1500	454	378	None	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 48.2'	Length 36.1'
Height 10.82'	Wing area 352 sq. ft.

## GENERAL DATA

This extremely fast and clean reconnaissance aircraft is equipped with direct fuel injection carburetors.



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DATE May 1945

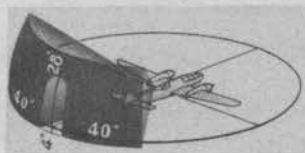
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253B-3

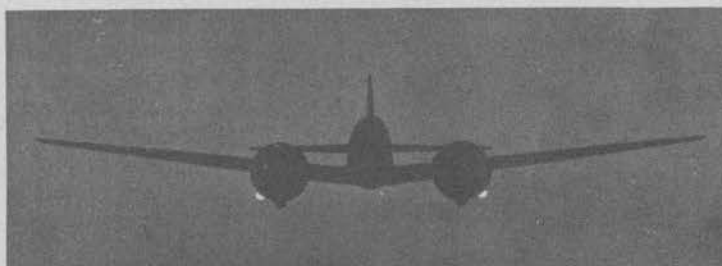
# DINAH 3

## FIELDS OF FIRE



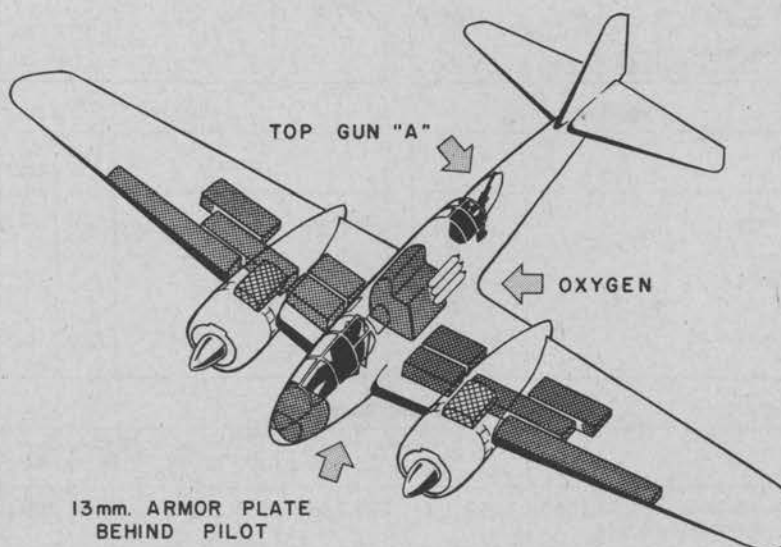
TOP GUN "A" 1x7.7mm.  
3/4-rear view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY



### LEGEND

Fuel tanks, unprotected	
Fuel tanks, protected	
Oil tanks, unprotected	
Oil tanks, protected	

### ARMAMENT

	No.	Size	Eds. Gun	Type
Rear Cockpit	1	7.7mm	4x707	Type 89 Flexible (Single)

### TACTICAL DATA

Cockpit gun is not always carried. Occasional an extra fuel tank is carried which obstructs the gun mounting.

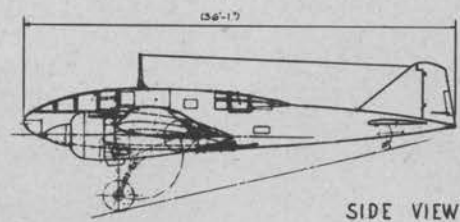
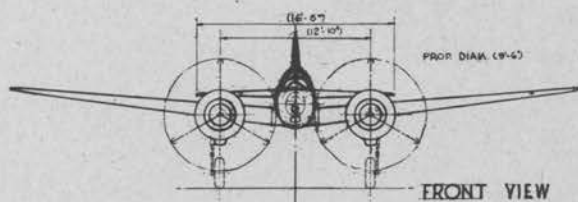
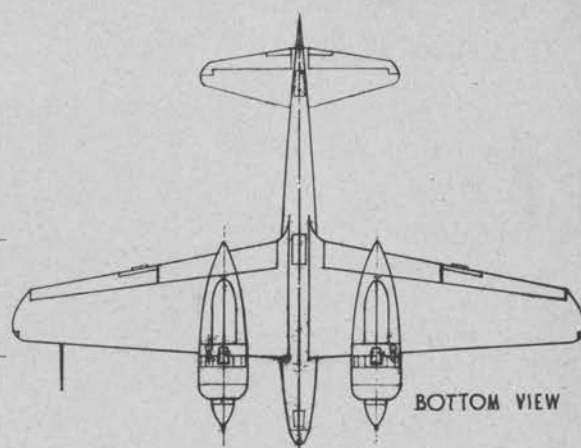
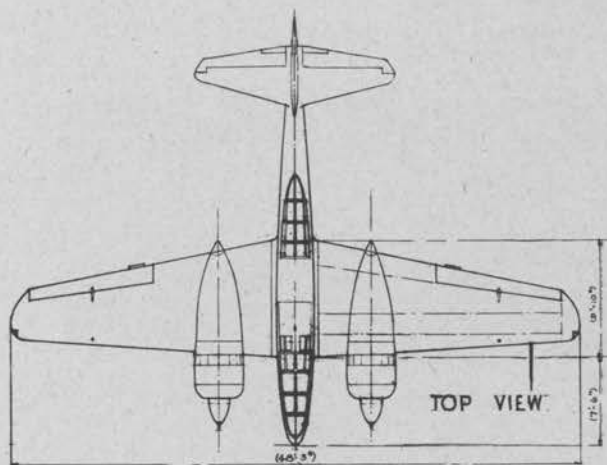
DATE May 1945

~~RESTRICTED~~

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253B-4

DINAH 3



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DATE May 1945

UNCLASSIFIED

CLARA 1

UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

TACTICAL DATA

No information.

DATE December 1944

UNCLASSIFIED

UNCLASSIFIED 254A-2

## PERFORMANCE AND CHARACTERISTICS

## CLARA 1

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty Reconnaissance
Designation Ki 70
Description
Mfg. Tachikawa
Engines 2 Crew
Construction All Metal

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

## BOMBS-CARGO

	No.	Size	Total lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off		
Normal		
Military		
War Emerg.		
Mfg.		
Model Ha 42		
Type		
Cylinders		Cooling
Supercharger		
Propeller		Diam.
Fuel - Take-off		Cruising

## WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

## RANGE AND RANGE

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	Length
Height	Wing area sq.ft.

## GENERAL DATA

CLARA 1 (Ki 70) is a twin-engine reconnaissance plane manufactured by Tachikawa. Powered with two 2000 h.p. 18 cyl. Ha 42 radial engines, CLARA is considered as a possible replacement for DINAH.

Provisional Data

DATE December 1944

UNCLASSIFIED

**EDNA 1**

UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

**ARMAMENT****TACTICAL DATA**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

No information.
-----------------

**DATE** December 1944**RESTRICTED**

UNCLASSIFIED 255A-2

## PERFORMANCE AND CHARACTERISTICS

EDNA 1

## TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

## AIRCRAFT

Duty Reconnaissance
Designation Ki 71
Description
Mfg.
Engines Crew
Construction

## SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum			

## ENGINES

	H. P.	Altitude
Take-off		
Normal		
Military		
War Emerg.		
Mfg.		
Model Ha 112		
Type		
Cylinders	Cooling	
Supercharger		
Propeller	Diam.	
Fuel - Take-off	Cruising	

## WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

## RANGE AND RANGE

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	Length
Height	Wing area sq. ft.

## GENERAL DATA

EDNA 1 (Ki 71) is a twin-engine reconnaissance plane powered by two 14 cylinder Ha 112 radial engines of 1575 h.p. at takeoff.

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Provisional Data

DATE December 1944

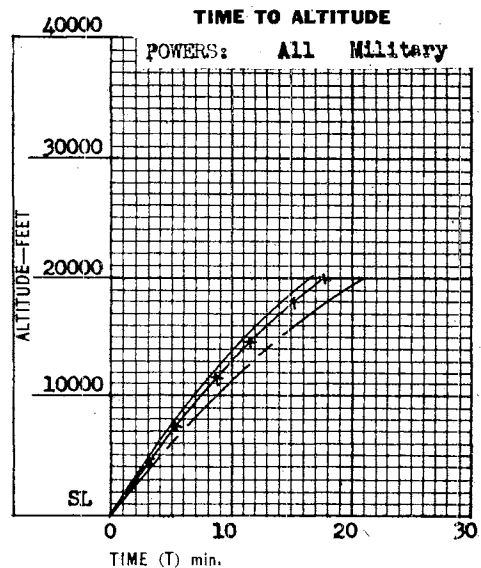
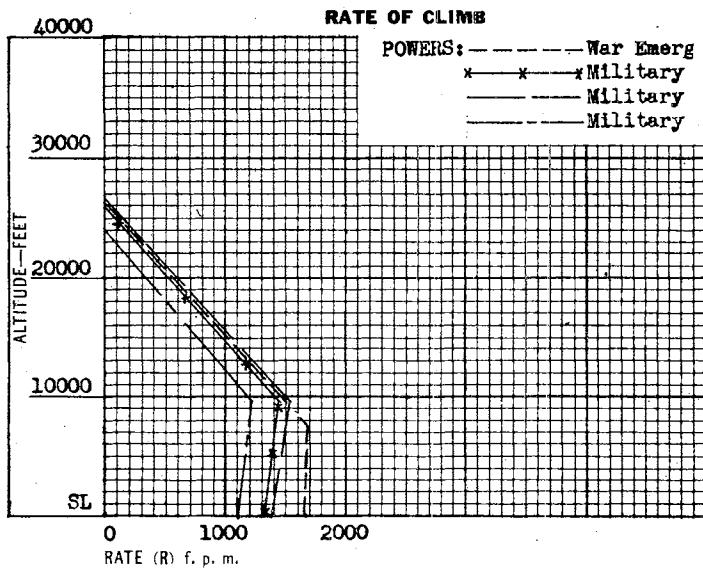
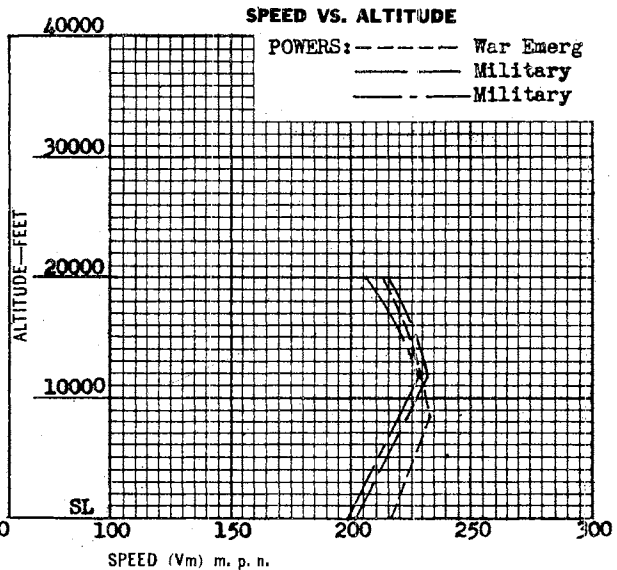
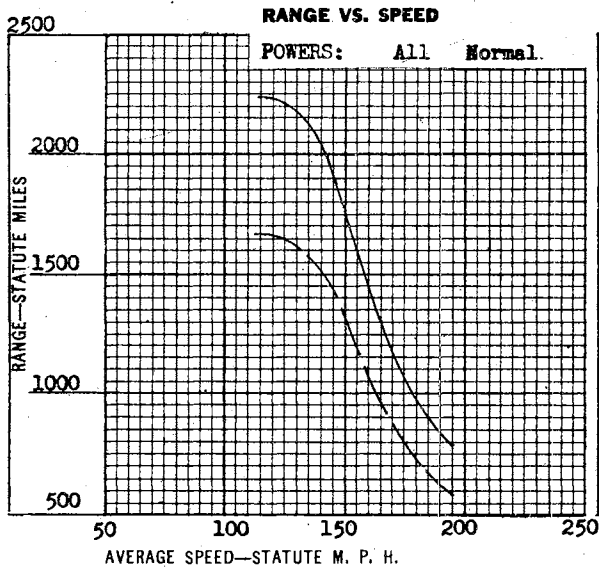
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KATE 12

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	RECONNAISSANCE	8834	2328	NONE
-----	RECONNAISSANCE	8834	2328	NONE
* * * * *	SCOUT -- RADAR	9034	2328	NONE
-----	NORMAL BOMBER	8731	1740	550
-----	NORMAL TORPEDO	9946	1740	1765



DATE December 1944

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# UNCLASSIFIED 301A-2

## KATE 12

### PERFORMANCE AND CHARACTERISTICS

#### TAKE-OFF

	Load	Feet
T.O. calm	9946	789
T.O. 25 kt. wind	9946	286
T.O. over 50' obstacle		
Landing over 50' obstacle		

#### CLIMB—CEILING

@ 9946 lbs.	lbs.	Feet	Min.
Rate @ S.L.		1105	1
Rate @ 9850 ft.		1205	1
Time to 10,000'			8.7
Time to 20,000'			21.8
Service ceiling 24,000'			

#### AIRCRAFT

Duty Torpedo Bomber
Designation Type 97, Model 12
Description Low-wing Monoplane
Mfg. Nakajima
Engines 1 Crew 2 or 3
Construction All Metal

#### SPEED

@ 9946 lbs.	Mph.	Knts.	Altitude
War Emerg. Maximum	216	187	@ S.L.
War Emerg. Maximum	199	172	@ 8,500'
War Emerg. Maximum	233	202	@ 10,850'
War Emerg. Maximum	228	197	@ 1,500'
Cruising 75% Economical	144	124	

#### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	800 kg (torp)	1760
or	1	250 kg (bomb)	550
Maximum			

#### ENGINES

	H. P.	Altitude
Take-off	985	S.L.
Normal		
Military	870	S.L.
War Emerg.	955	9,850'
	1030	7,500'

#### WEIGHTS

	Lbs.
Empty	5439
Gross (Bomber)	8731
Overload (Torpedo)	9946

#### FUEL

	U.S. gal.	Imp. gal.
Built-in	290	241
Internal (Removable)		
External (drop)	98	81
Maximum	388	322

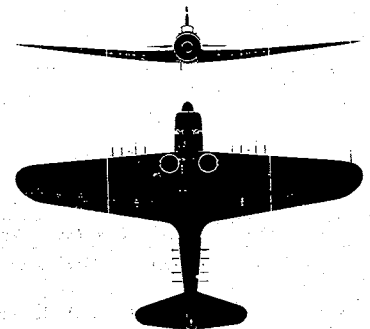
Mfg. Nakajima
Model Sakae 11
Type Radial
Cylinders 14 Cooling Air
Supercharger Single Speed
Propeller 3 Blade Diam. 10.5' C.S.
Fuel - Take-off 92 Cruising 92

#### \* RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range	2240	1945	114	99	1500	388	322	None	None
Reconnaissance	1875	1628	146	127	1500	388	322	None	None
At 75% Vmax.	1665	1446	113	97	1500	290	241	1760	None
Maximum range	1400	1216	146	127	1500	290	241	1760	None
Torpedo									
At 75% Vmax.									
Radius ( )									
Radius ( )									

#### DIMENSIONS

Span 50.9'	Length 34.2'
Height 13.5'	Wing area 415 sq. ft.



#### GENERAL DATA

KATE is rapidly becoming obsolete, being replaced by faster carrier aircraft such as MYRT and JILL.

\* Maximum Range (Reconnaissance) figures are given for a scout condition of 8834 lbs. gross weight. Maximum Range (Torpedo) data is given with the plane in an overload condition

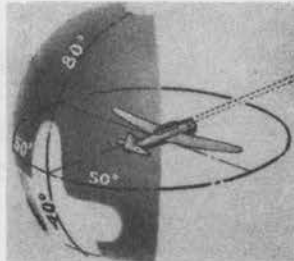
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## KATE 12

## FIELDS OF FIRE



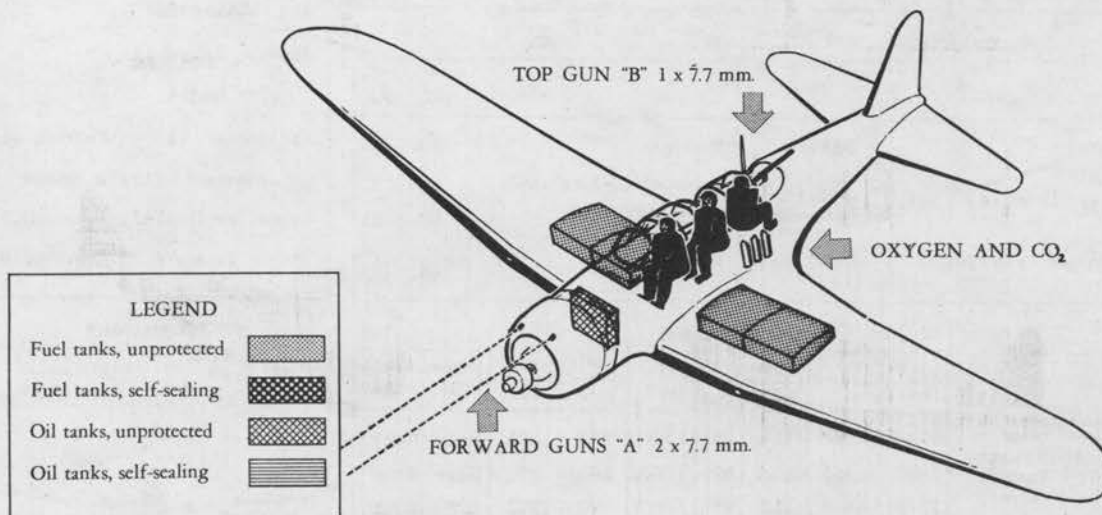
TOP GUN "B" AND  
FORWARD GUNS "A"  
¾-rear view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7mm	600	Fixed	Tail				
Top Rear Cockpit Side	1	7.7mm	300	Flex.	Wing				
Bottom									

## TACTICAL DATA

KATE is vulnerable to attack because of its low speed and unprotected crew and fuel tanks.

Radar is carried.

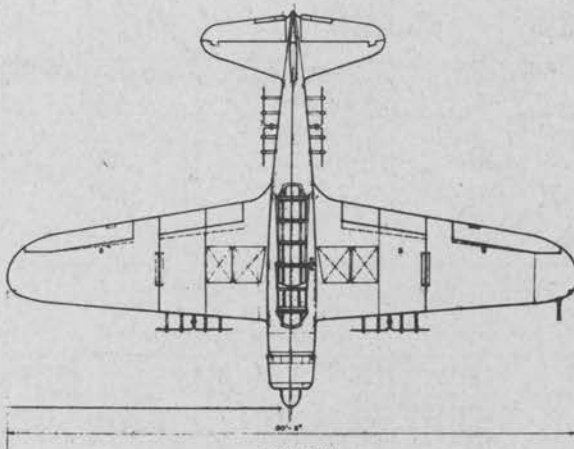
DATE December 1944

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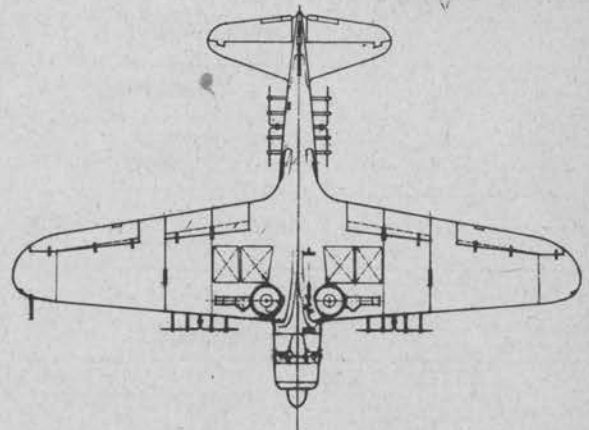
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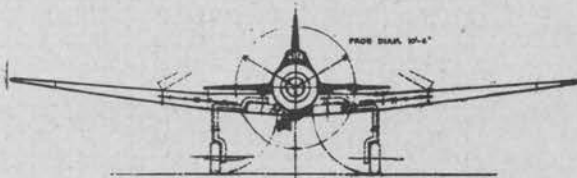
# KATE 12



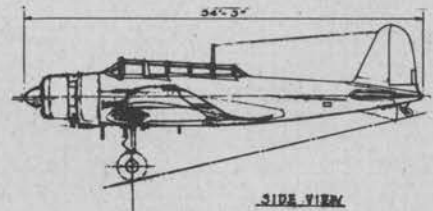
TOP VIEW



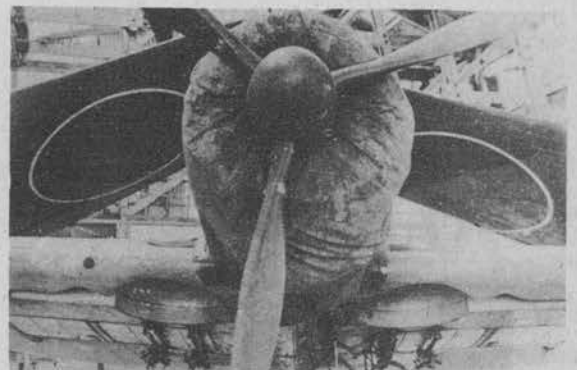
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



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DATE December 1944

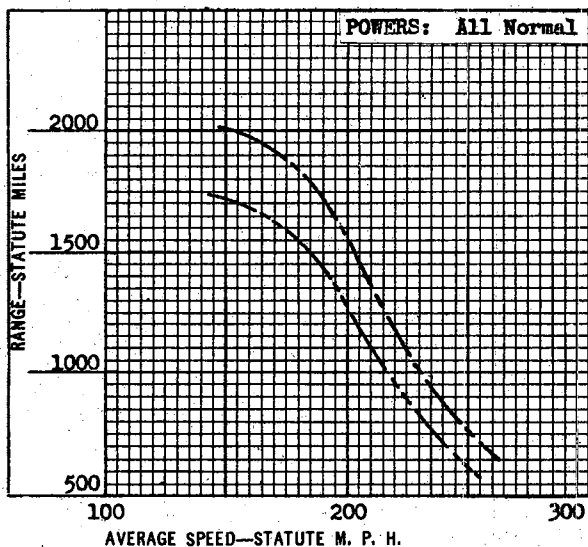
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JILL 12

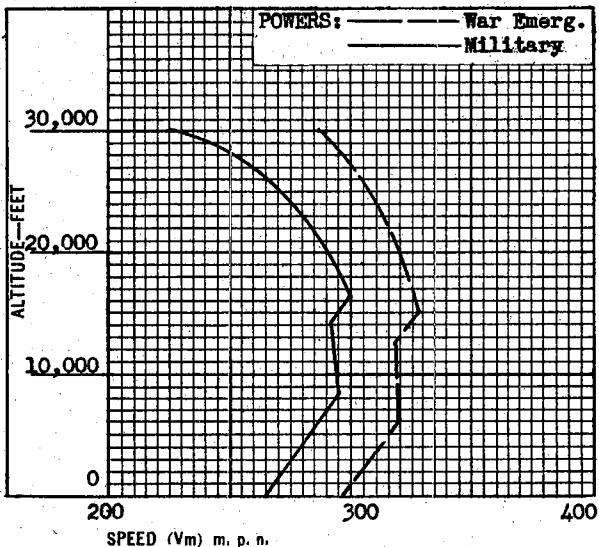
# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL TORPEDO	11,470	1272	3250
-----	OVERLOAD TORPEDO	12,456	2242	3250
-----	NORMAL COMBAT	8220	1272	None
-----	OVERLOAD RECONNAISSANCE	10,778	2480	None

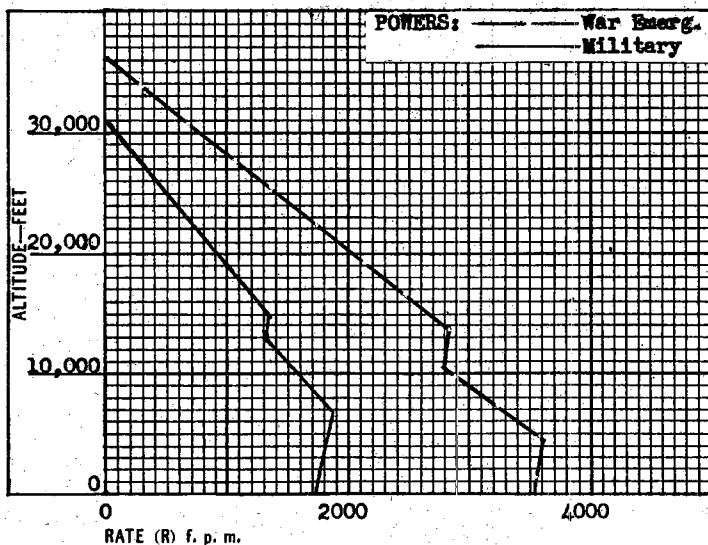
RANGE VS. SPEED



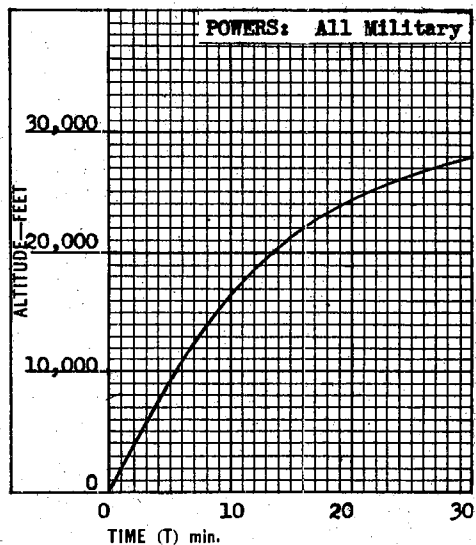
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE May 1945

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## PERFORMANCE AND CHARACTERISTICS

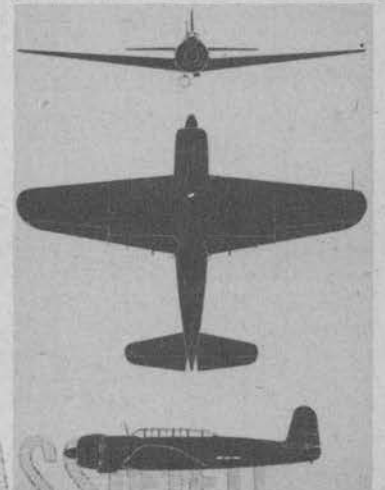
TAKE-OFF			CLIMB—CEILING			AIRCRAFT	
	Load	Feet	@ 8220	lbs.	Feet	Min.	Duty Torpedo Bomber
<b>Runway Requirements</b>			Rate @ S. L.		3540	1	Designation Tenzan Model 12 B6N2
Normal Torpedo	11,470	1352	Rate @ 13,800 ft.		2810	1	Description Low wing monoplane
Recco	8,220	616	Time to 10,000			5.6	Mfg. Nakajima
			Time to 20,000			13.7	Engines 1 Crew 3
			Service ceiling		35,400		Construction All metal; semi-monocoque fuselage, cantilever wing.

SPEED				BOMBS—CARGO			ENGINES			
@ 8220 lbs.	Mph.	Knts.	Altitude		No.	Size	Total Lbs.		H. P.	Altitude
Maximum	297	257	@ S. L.	Normal	1	x 1475kg Tor	3250	Take-off	1820	S.L.
Maximum	327	282	@ 15,100'	or	1	x 800kg Bomb	1760	Normal	1150	1500'
				or	1	x 500kg Bomb	1100			
Cruising - Combat	263	225	@ 1500'	or	2	x 250kg Bomb	1100	Military	1655	6800'
Economical - Cruising	147	127	@ 1500'	Maximum					1415	15,200'
								War Emerg.	1880	4400'
									1620	13,800'

WEIGHTS		Lbs.	FUEL		U. S. gal.	Imp. gal.
Empty		6800	Built-in		413	344
Gross		11,470	Internal (Removable)			
Overload Recco		10,778	External (drop)			
Torpedo		12,456	Maximum		413	344

RANGE AND RADIUS										DIMENSIONS	
	Miles	Speed	Alt. feet	Fuel gal.	Bombs lbs.	Cargo lbs.				Span	Length
	stat.	naut.	mph.	Knts.	U. S.	Imp.				Height	Wing area
Maximum range Recco (maximum fuel)	2010	1737	147	127	1500'	413	344	None	None	14'7"	36.1'
Range @ Combat Cr	650	565	263	225	1500'	413	344	None	None		395 sq. ft.
Maximum range (Overload torpedo)	1740	1512	143	123	1500'	374	311	3250	None		
Range @ Combat Cr Radius	575	499	255	218	1500'	374	311	3250	None		
Radius ( )											

GENERAL DATA	
<p>JILL is a torpedo bomber designed to replace KATE. JILL 11 is similar to JILL 12 except that JILL 11 is equipped with MAMORU 11 engine and has a somewhat lower critical altitude than JILL 12.</p>	



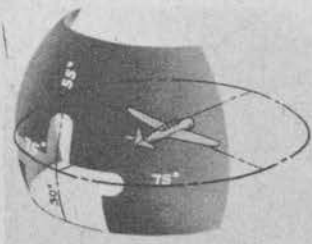
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DATE May 1945

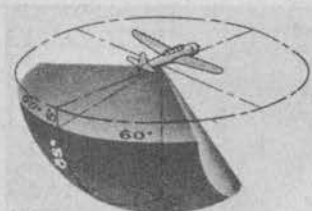


JILL 12 UNCLASSIFIED

## FIELDS OF FIRE

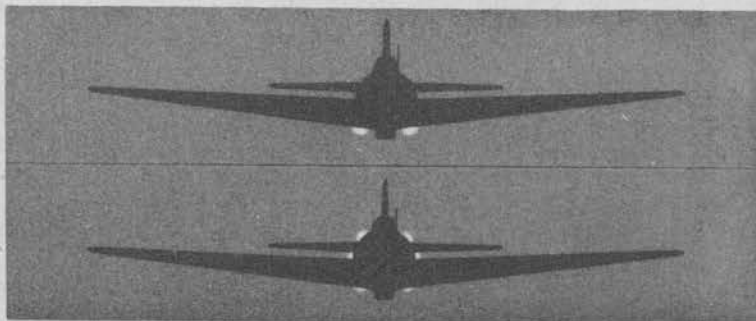


TOP GUN "A"  
3/4-rear view from above  
Provisional field of fire



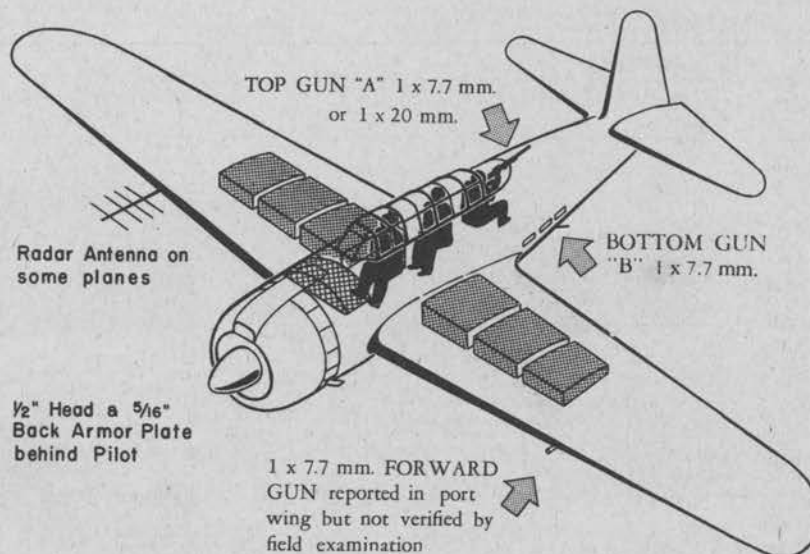
BOTTOM GUN "B"  
3/4-rear view from above

## EXHAUST FLAME PATTERNS



REAR VIEW  
Flame Patterns vary

## VULNERABILITY



## LEGEND

Fuel tanks, unprotected

Fuel tanks, self-sealing

Oil tanks, unprotected

Oil tanks, self-sealing

## ARMAMENT

	No.	Size	Rds. Gun	Type
Rear Cockpit or	1	7.7mm	6x97	Type 92 Flexible, (Lewis)
	1	20 mm	?	Type 99 Mk.1 Flexible (Oerlikon)
Bottom	1	7.7mm	5x97	Type 92 Flexible, (Lewis)

## TACTICAL DATA

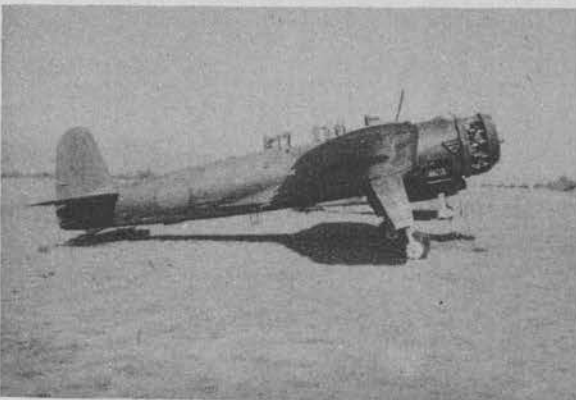
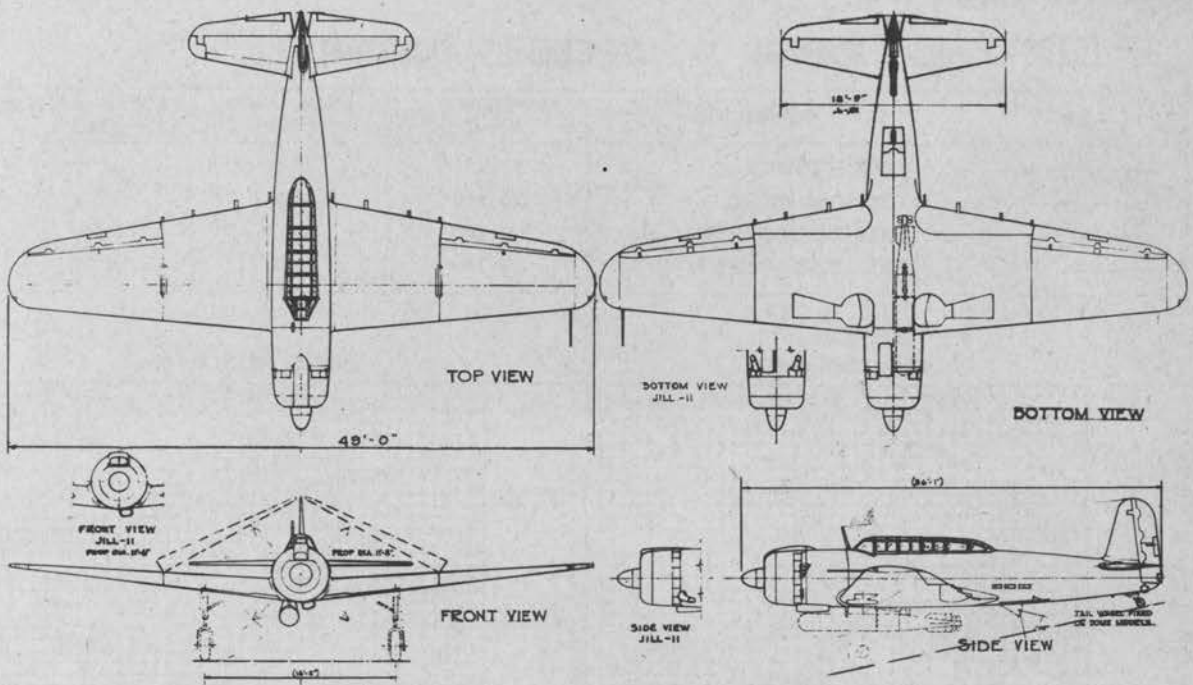
Documents report that a 13 mm flexible top gun and a 7.9 mm flexible bottom gun will replace the present 7.7 mm guns.

Pilot's back armor and radar found on some JILLs.

DATE May 1945

RESTRICTED

## JILL 12



RESTRICTED

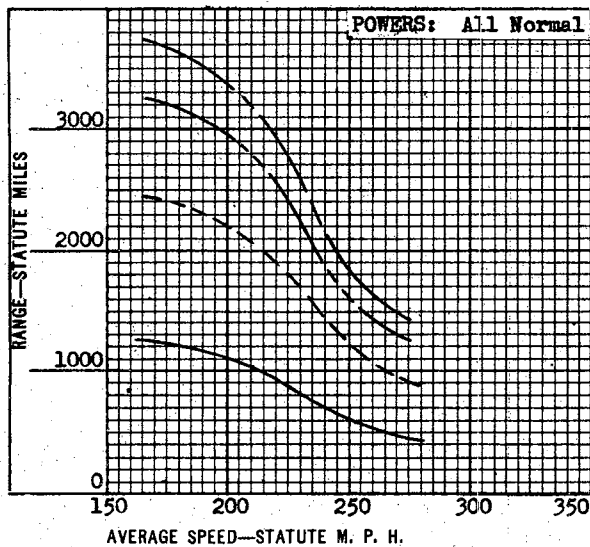
DATE May 1945

## FRANCES 11

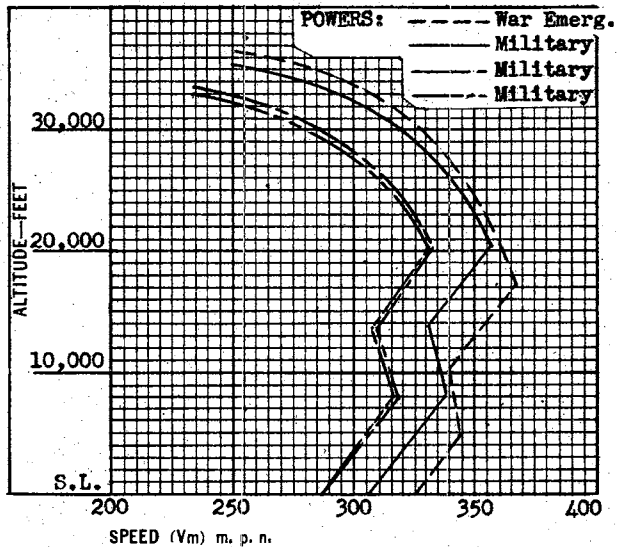
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
-----	NORMAL BOMBER	23,150	2823	1875
=====	OVERLOAD BOMBER	26,460	5878	1875
=====	MAX. FUEL - RECONNAISSANCE	28,450	9505	None
-----	MAX. FUEL - BOMBER	29,180	8460	1775

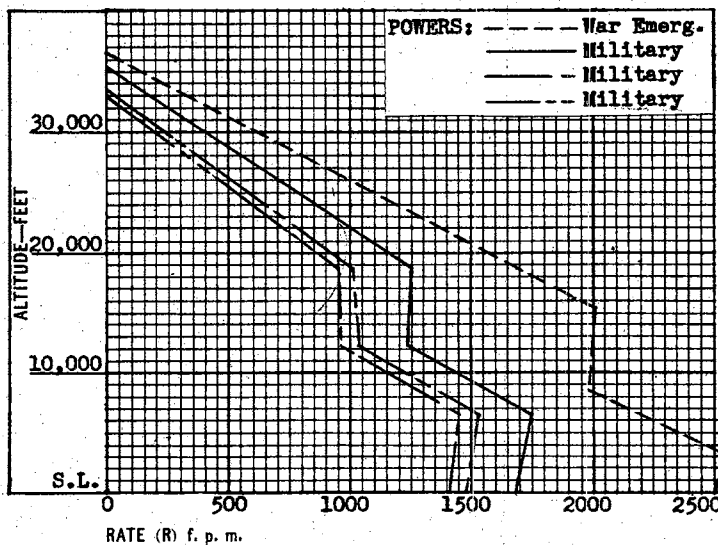
RANGE VS. SPEED



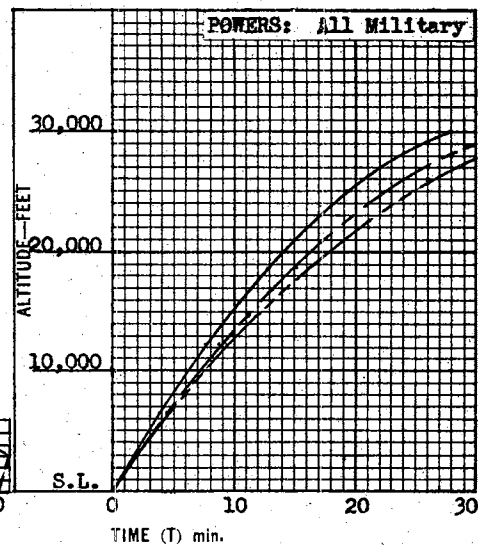
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



### PERFORMANCE AND CHARACTERISTICS

#### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	23,150	1960
T. O. over 50' obstacle		
Landing over 50' obstacle		

#### CLIMB—CEILING

@ 23,150 lbs.	Feet	Min.
Rate @ S. L.	2500	1
Rate @ 15,400 ft.	2010	1
Time to 10,000		6.1
Time to 20,000		14.0
Service ceiling	35,530	

#### AIRCRAFT

Duty Medium & Torpedo Bomber
Designation Ginka, Model 11
Description Mid-wing monoplane
Mfg. Nakajima
Engines 2 Crew 3
Construction All metal; semi-monocoque fuselage, cantilever wing

#### SPEED

@ 23,150 lbs.	Mph.	Knts.	Altitude
Maximum	325	272	@ S. L.
Maximum	367	317	@ 17,200'
Cruising - Combat	281	242	@ 1500'
Economical - Cruising	163	140	@ 1500'

#### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1 x	800kg Bomb	1775
or	1 x	800kg Torp	1875
or	2 x	500kg Bomb	2237
Maximum	2 x	250kg Bomb	1155

#### ENGINES

	H. P.	Altitude
Take-off	1795	S.L.
Normal	1150	1500'
Military	1625	6600'
	1420	18,700'
War Emerg.	1840	3000'
	1610	15,100'

#### WEIGHTS

	Lbs.
Empty	14,665
Gross	23,150
Overload Bomber	26,460
Recco	28,450

#### FUEL

	U. S. gal.	Imp. gal.
Built-in	1013	844
Internal (Removable)	293	244
External (drop)	278	232
Maximum	1584	1320

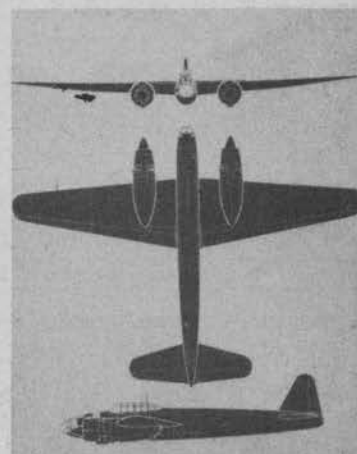
Mfg. Nakajima
Model Homare 11
Type Radial
Cylinders 18 Cooling Air
Supercharger Two speed
Propeller 3 Blade CS Diam. 11.48'
Fuel-Take-off 92 Cruising 92 plus ADI

#### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range Recco (maximum fuel)	3737	3245	165	142	1500	1584	1320	None	None
Range @ Combat Cr	1413	1227	275	237	1500	1584	1320	None	None
Maximum range Bomber	2430	2110	165	142	1500	980	816	1875	None
Range @ Combat Cr	887	770	279	242	1500	980	816	1875	None
Radius ( )									
Radius ( )									

#### DIMENSIONS

Span 65.62'	Length 49.2'
Height 14'1"	Wing area 592 sq. ft.



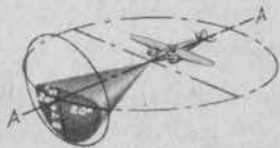
#### GENERAL DATA

FRANCES is expected to be used primarily as a torpedo bomber and secondarily for level and glide bombing.

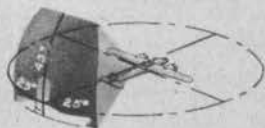


# FRANCES 11

## FIELDS OF FIRE



FORWARD GUN "A" 1 x 20 mm.  
 1/4-front view from above  
 Turret can be rotated mechanically thru  
 360° about axis "A"-"A"



TOP GUN "B" 1 x 20 mm.  
 1/4-rear view from above

## EXHAUST FLAME PATTERNS



REAR VIEW



ARMOR PLATE

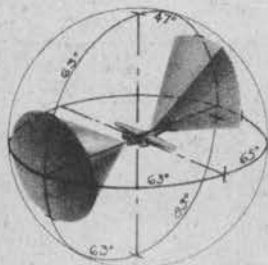


20 mm.

1

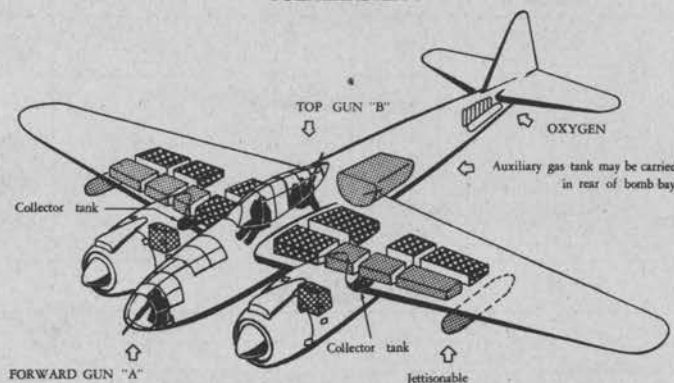
Viewed from rear

## FIRE FREE FIELDS



1/4-front view from above  
 FORWARD GUN shows full rotation coverage.

## VULNERABILITY



Two Jettisonable gas tanks may be carried in bomb bay in place of bomb load.

### LEGEND

Fuel tanks, self-sealing



Fuel tanks, unprotected



Oil tanks, protected



Oil tanks, unprotected



## ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	1	20 mm	3x30	Type 99 Mk.1 Flexible, (Oerlikon)
Rear Cockpit	1	20 mm	5x30	Type 99 Mk.1 Flexible, (Oerlikon)

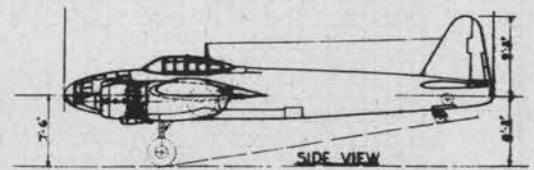
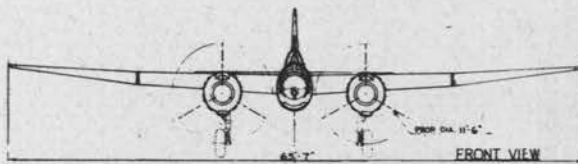
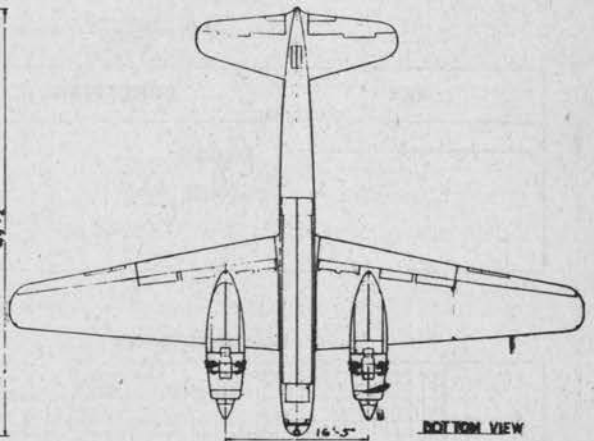
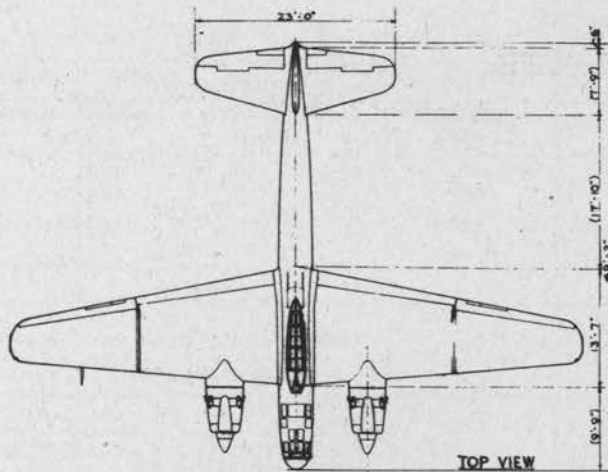
## TACTICAL DATA

The nose dome is power rotated.

FRANCES 11 is equipped with pilot's back and head armor plate. There have been indications that some armor plate has been used for fuel tank protection.

DATE May 1945

RESTRICTED



RESTRICTED

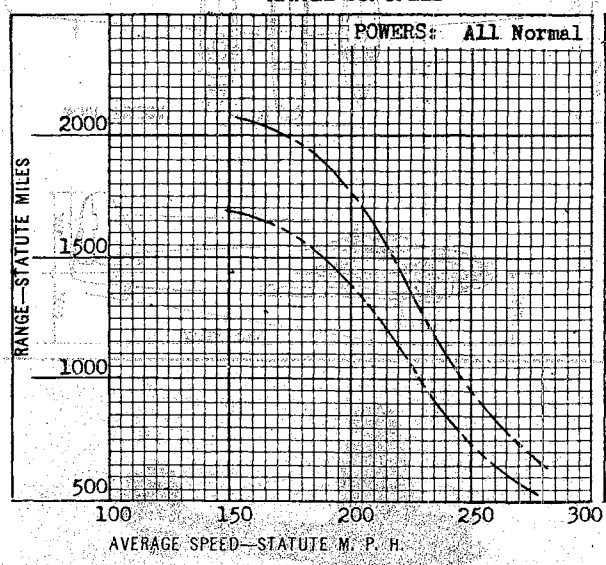
DATE May 1945



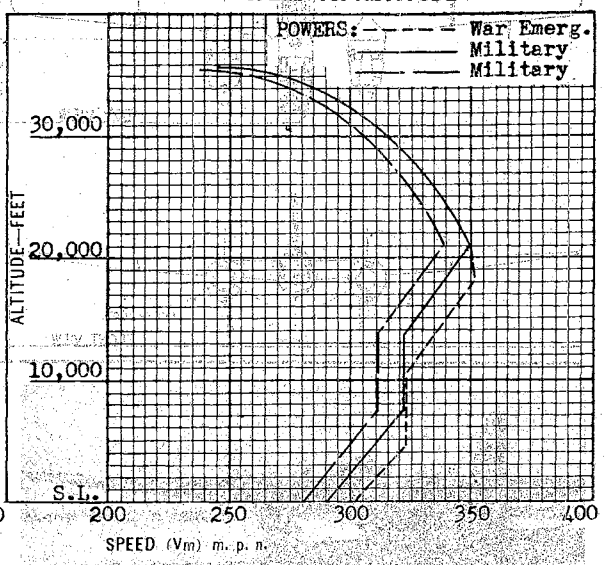
**RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL BOMBER	10,460	1292	1765
-----	NORMAL BOMBER	10,460	1292	1765
-----	NORMAL TORPEDO	10,570	1292	1875
-----	OVERLOAD BOMBER	11,488	2320	1765
-----	OVERLOAD TORPEDO	11,183	1904	1875

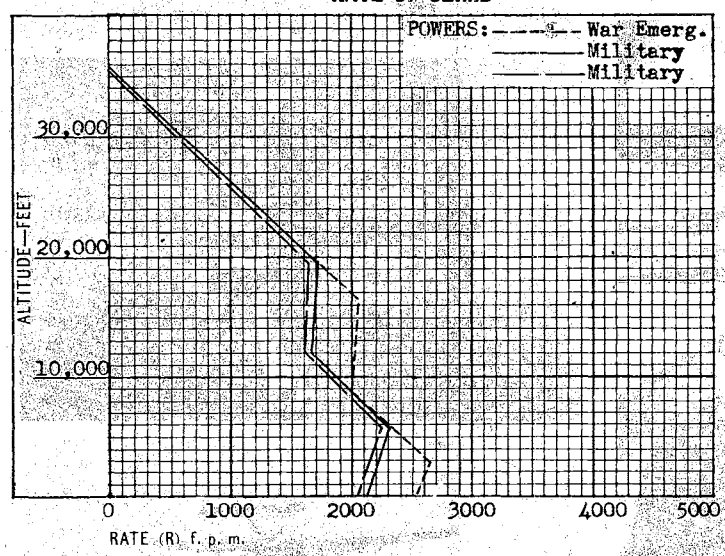
**RANGE VS. SPEED**



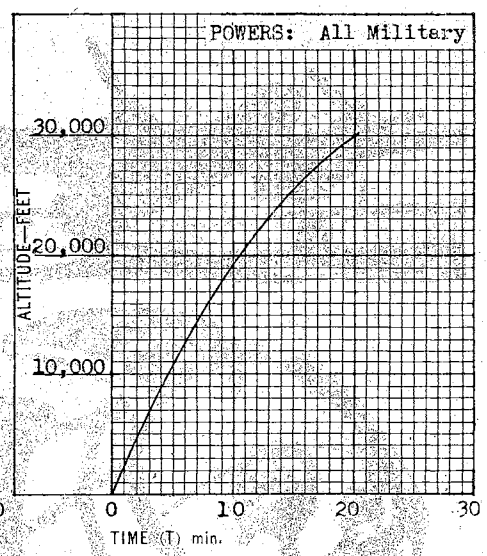
**SPEED VS. ALTITUDE**



**RATE OF CLIMB**



**TIME TO ALTITUDE**



304A-2  
UNCLASSIFIED  
GRACE 11

# PERFORMANCE AND CHARACTERISTICS

## TAKE-OFF

	Load	Feet
Runway Requirements	10,460	1336
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@ 10,460 lbs.	Feet	Min.
Rate @ S.L.	2530	1
Rate @ 16,600 ft.	2050	1
Time to 10,000		4.7
Time to 20,000		10.5
Service ceiling	34,850	

## AIRCRAFT

Duty Torpedo Bomber
Designation Ryusei 11
Description Mid-wing Monoplane with inverted gull wings.
Mfg. Aichi. 21st Naval Air Arsenal
Engines 1 Crew 2
Construction

## SPEED

@10460lbs.	Mph.	Knts.	Altitude
Maximum	303	263	@ S. L.
Maximum @ 11,488 lbs	346	300	@ 16,600'
Cruising - Combat	282	245	@ 1500'
Economical Cruising	153	133	@ 1500'

## BOMBS-CARGO

	No.	Size	Total Lbs.
Maximum	1 x	800 kg	1760
or	1 x	500 kg	1100
or	2 x	250 kg	1100
or	6 x	60 kg	792
or	1 x	800 kg Torpedo	1760

## ENGINES

	H. P.	Altitude
Take-off	1970	S.L.
Normal	1540	1500'
Military	1875	5900'
	1675	19600'
War Emerg.	2050	2500'
	1830	16500'

## WEIGHTS

	Lbs.
Empty	6,770
Gross	10,460
Overload Bomber	11,488
Torpedo	11,183

## FUEL

	U.S. gal.	Imp. gal.
Built-in	407	339
Internal (Removable)		
External (drop)		
Maximum	407	339

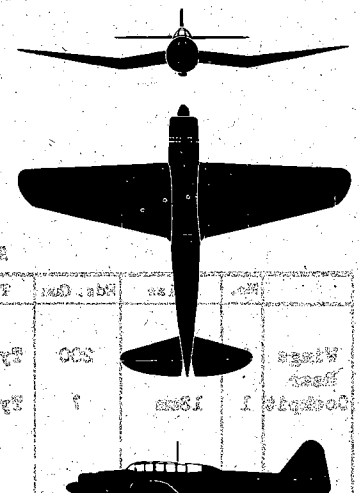
Mfg. Nakajima
Model Homare 21
Type Radial
Cylinders 18 Cooling Air
Supercharger 2 Speed
Propeller 4 Blade Diam. 10.83' C.S.
Fuel - Take-off 91 Cruising 87 plus ADI

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2075	1800	153	133	1500	407	339	1770	None
Range @ Combat or	645	560	282	245	1500	407	339	1770	None
Maximum range Torpedo	1695	1472	150	130	1500	334	278	1870	None
Range @ Combat or	520	452	278	241	1500	334	278	1870	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 47.25'	Length 37.6'
Height 14.6'	Wing area 372.5 sq. ft.



ATAQ JACITQAT

## GENERAL DATA

TAUENBQA

GRACE was designed to replace or succeed the obsolete KATE and the newer JILL.
Although designed for torpedo bombing, there may possibly be a dive bomber version.
Few GRACES have been encountered thus far.

RESTRICTED

PROVISIONAL DATA

DATE June 1945

UNCLASSIFIED

**GRACE 11**

UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type
Wings	2	20mm	200	Type 99 Mk 1 Mod 4 Fixed, Oerlikon type.
Rear				
Cockpit	1	13mm	?	Type 2 Flexible, German MG 131 type.

**TACTICAL DATA**

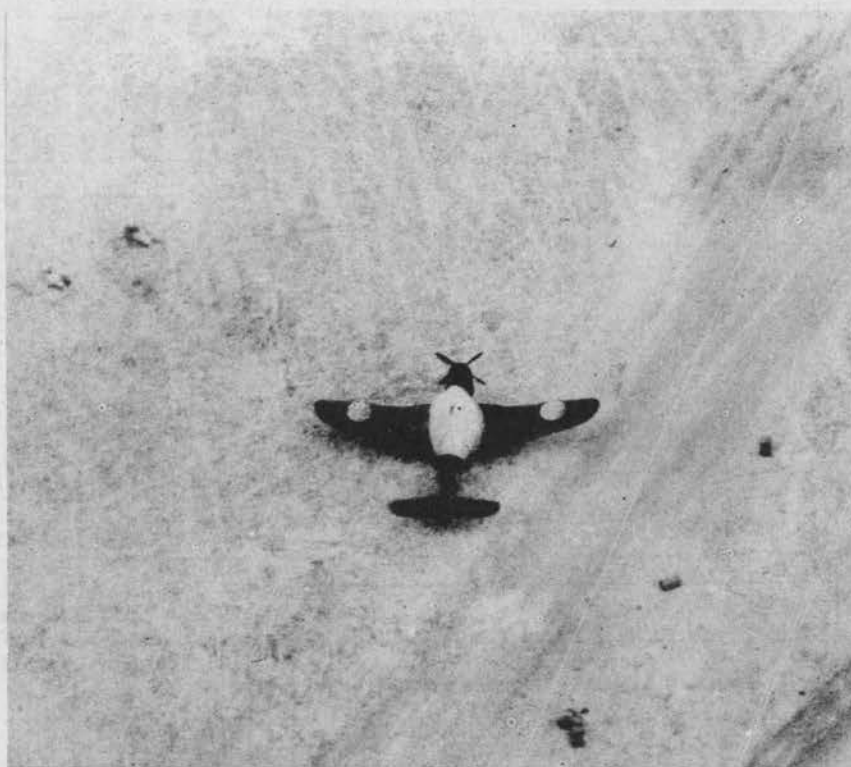
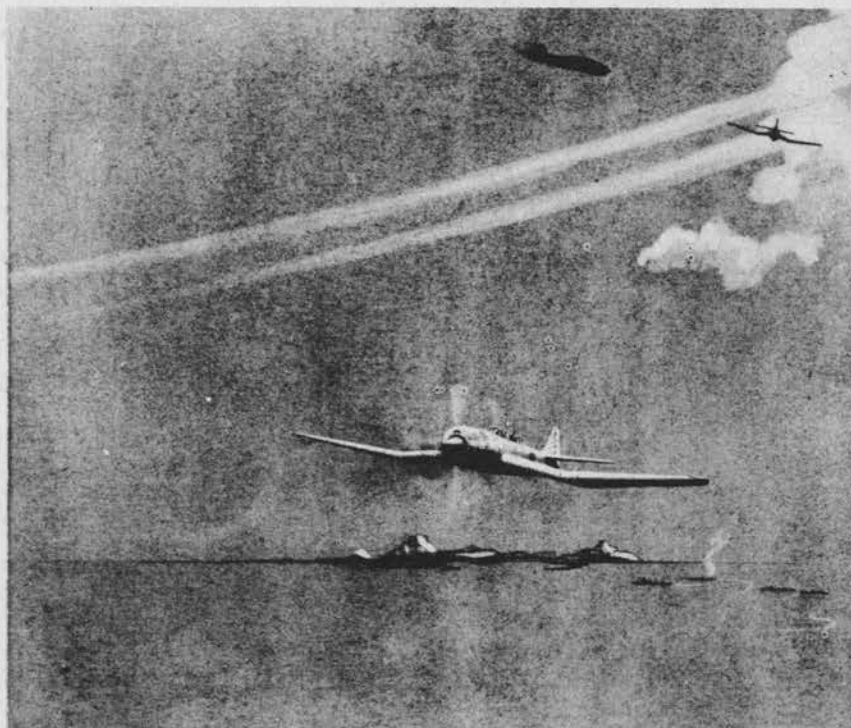
Original armament was  
2 x 7.7mm fixed guns in the  
cowl and 1 x 7.7mm flexible  
in the rear cockpit.

DATE June 1945

UNCLASSIFIED

RECORDED

UNCLASSIFIED 304A-4  
GRACE 11



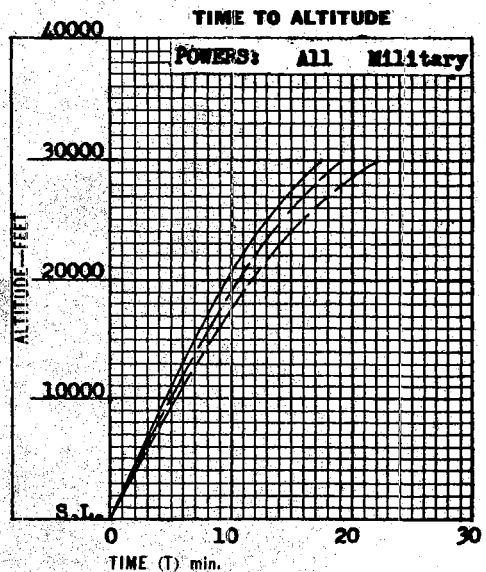
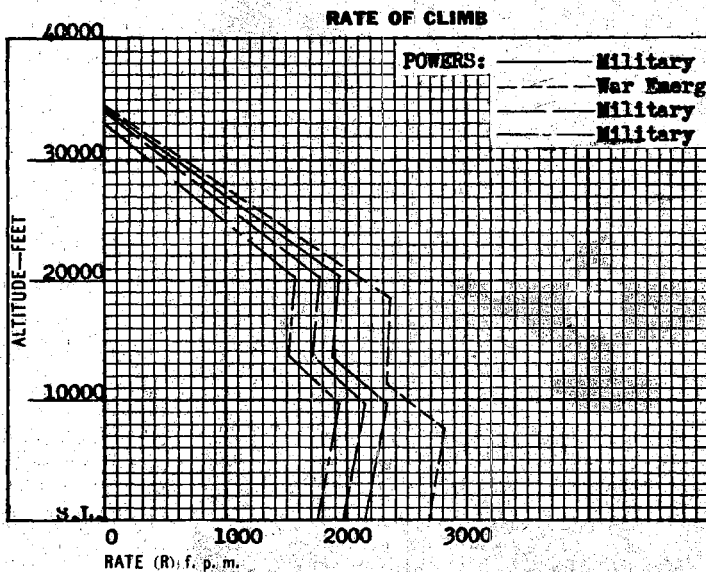
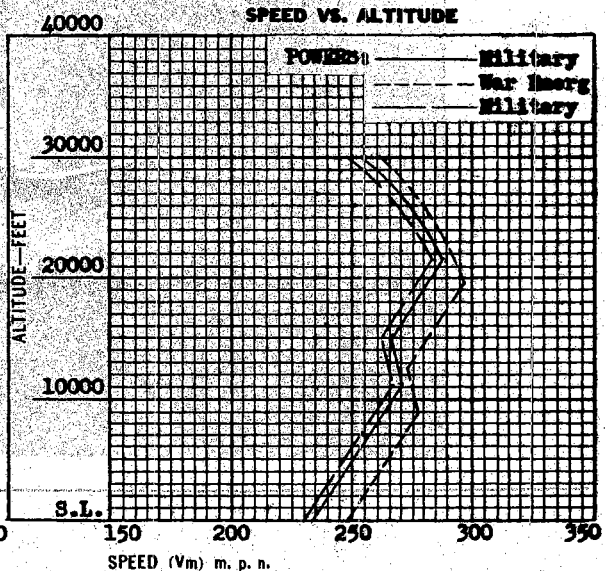
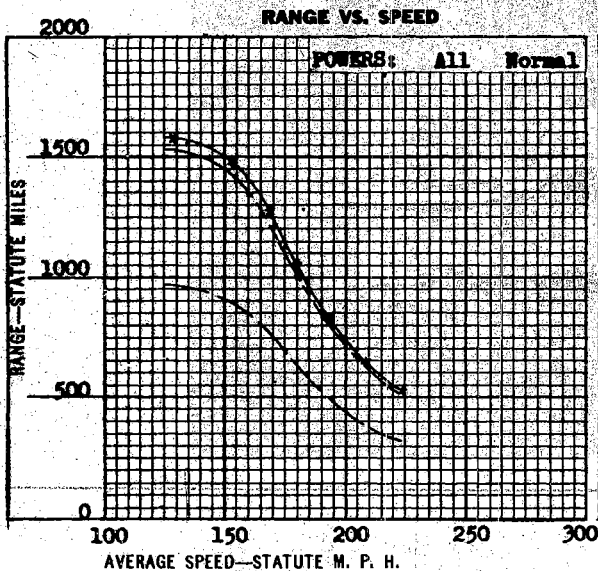
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DATE June 1945

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# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	RECONNAISSANCE	7830	1050	None
-----	RECONNAISSANCE	7830	1050	None
* * * * *	RECONNAISSANCE (Max. Fuel)	8492	1712	None
-----	NORMAL BOMBER	8380	1050	550
-----	BOMBER (Max. Fuel)	9042	1712	550



DATE December 1944

UNCLASSIFIED

UNCLASSIFIED 401A-2

# PERFORMANCE AND CHARACTERISTICS

VAL 22

## TAKE-OFF

	Load	Feet
T.O. calm	7830	516
T.O. 25 kt. wind	7830	188
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@ 7830	lbs.	Feet	Min.
Rate @ S.L.		2160	1
Rate @ 9850	ft.	2330	1
Time to 10,000'			4.5
Time to 20,000'			9.5
Service ceiling 33,600'			

## AIRCRAFT

Duty Dive Bomber
Designation Type 99, Model 22
Description Low-wing Monoplane
Mfg. Aichi
Engines 1 Crew 2
Construction All metal

## SPEED

@ 7830 lbs.	Mph.	Knts.	Altitude
Maximum	230	200	@ S.L.
Maximum	261	226	@ 9,850'
Maximum	281	244	@ 20,300'
Cruising 75%	168	145	1,500'
Economical			

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	1	x 250 kg	550
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1280	S.L.
Normal		
Military	1185	9,850'
	1085	20,300'
War Emerg.	1355	7,700'

## WEIGHTS

	Lbs.
Empty	5670
Gross - Scout	7830
Gross - Bomber	8380
Overload	9042

## FUEL

	U.S. gal.	Imp. gal.
Built-in	286	237
Internal (Removable)		
External (drop)		
Maximum	286	237

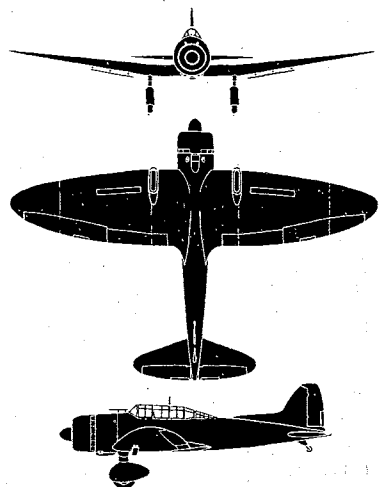
Mfg. Mitsubishi
Model Kinsei 54
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 Blade Diam. 10.5'
Fuel - Take-off 92 Cruising 92

## RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1580	1372	126	109	1500	286	237	None	None
At 75% Vmax.	1285	1115	168	145	1500	286	237	None	None
Maximum range (normal fuel)	965	838	125	108	1500	175	145	550	None
At 75% Vmax.	785	682	167	144	1500	175	145	550	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 47.5'	Length 35.4'
Height 13'	Wing area 376 sq.ft.



## GENERAL DATA

VAL 22 is an improved version of VAL 11, being equipped with a new, more powerful engine and a better streamlined fuselage.

Maximum Range with Maximum Fuel was calculated using a full fuel load of 286 gallons in an overload reconnaissance condition for a gross weight of 8492 lbs. Maximum Range with normal fuel was based on a reconnaissance condition of 7380 lbs. gross weight.

DATE December 1944

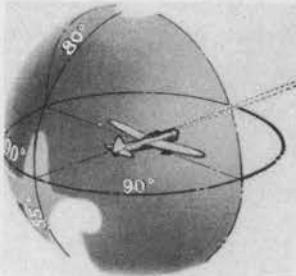
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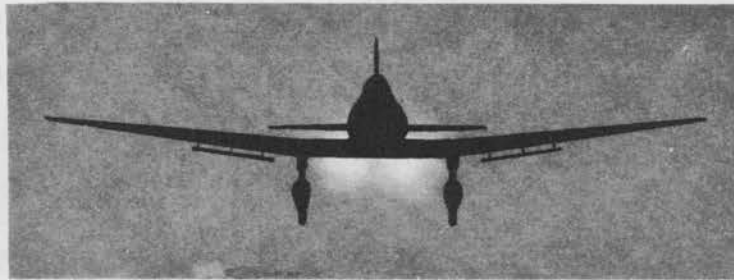
## VAL 22

## FIELDS OF FIRE



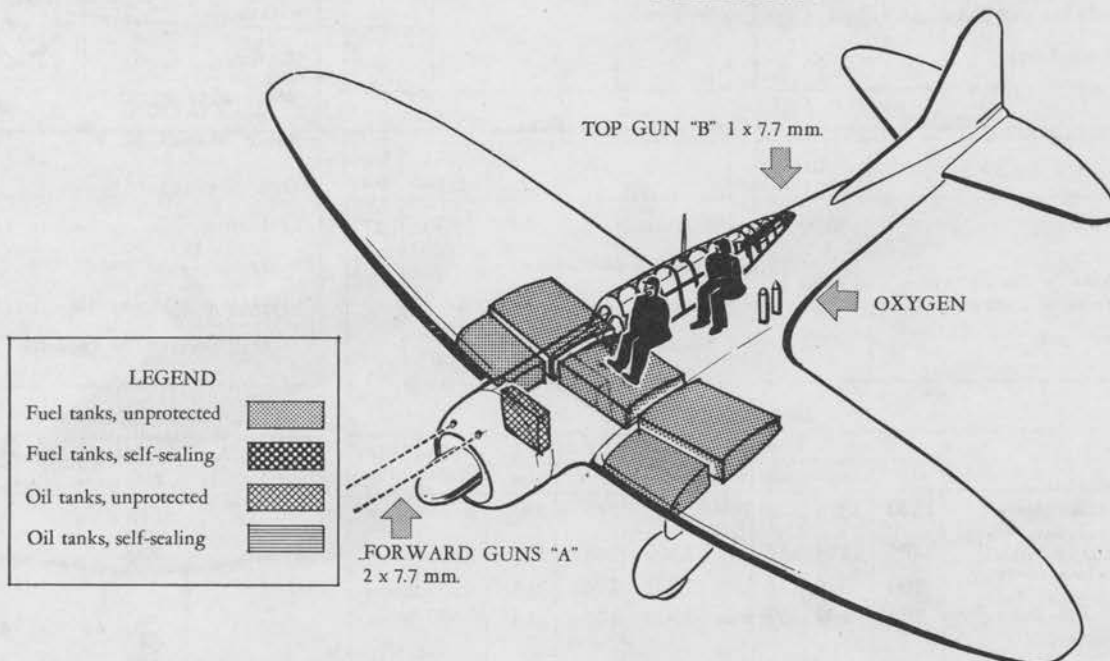
TOP GUN "B" AND  
FORWARD GUNS "A"  
¾-rear view from above

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY



## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	2	7.7 mm	791	Fixed	Tail				
Top					Wing				
Rear									
Cockpit	1	7.7 mm	1000	Flex.					
Side									
Bottom									

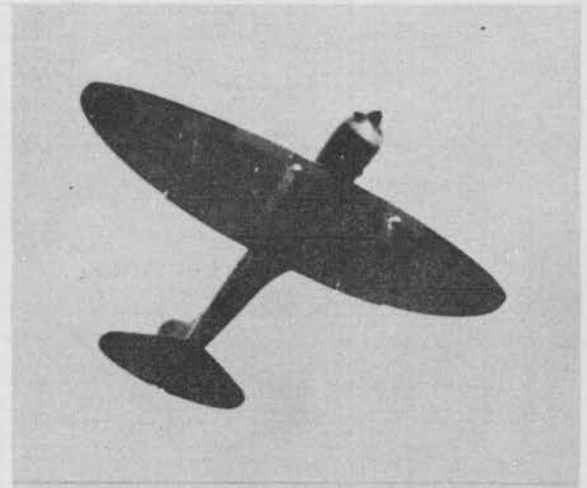
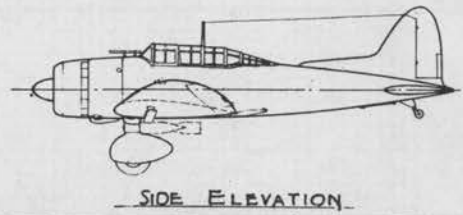
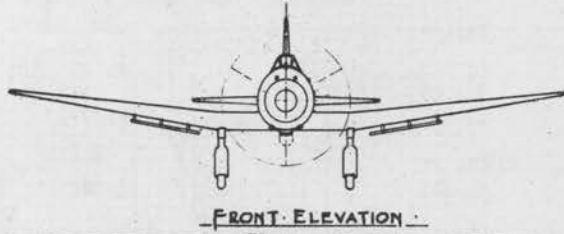
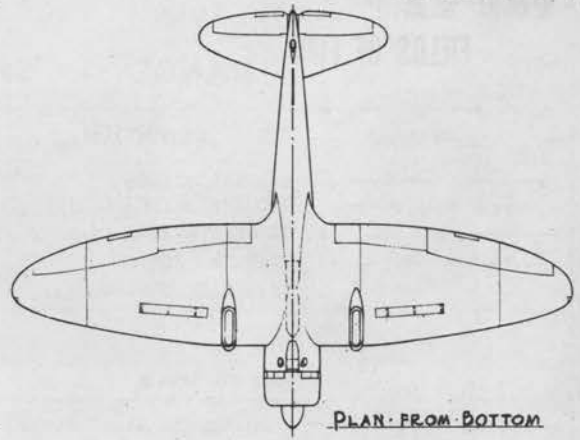
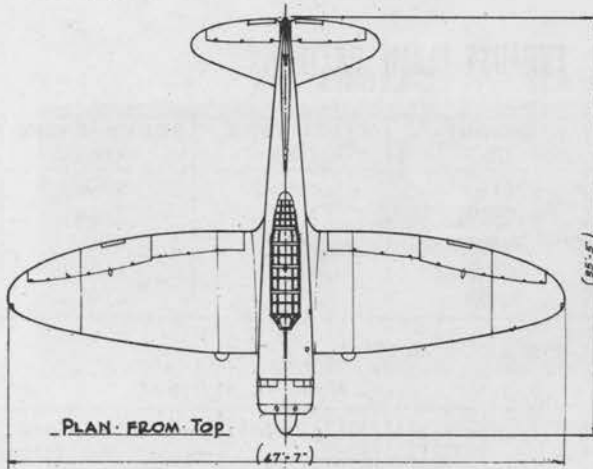
## TACTICAL DATA

Up to the present time, neither fuel tank protection nor armor plate has been found on VAL.

DATE December 1944

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RESTRICTED

DATE December 1944

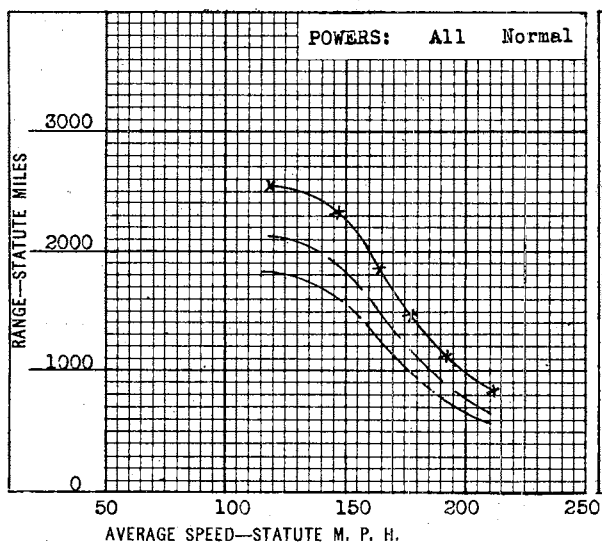
UNCLASSIFIED

NELL 23

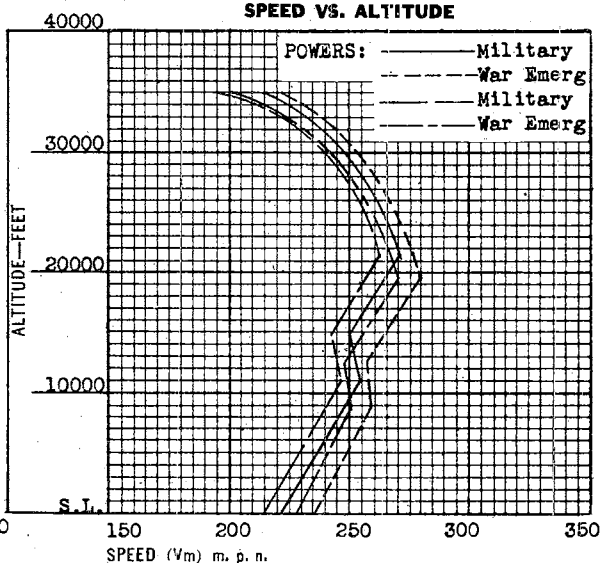
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
—————	RECONNAISSANCE	18750	5070	None
- - - - -	RECONNAISSANCE	18750	5070	None
* * * * *	RECONNAISSANCE (Max. Fuel)	20400	5740	None
—————	OVERLOAD BOMBER	20400	4770	1100
- - - - -	OVERLOAD TORPEDO	20400	4150	1765

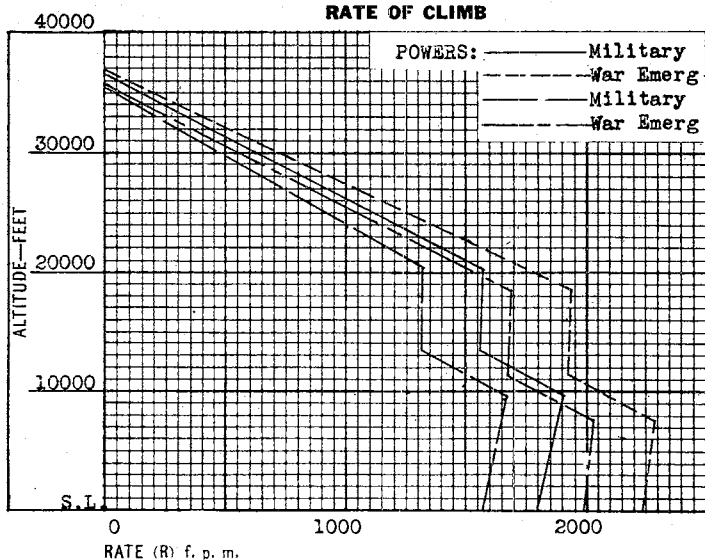
RANGE VS. SPEED



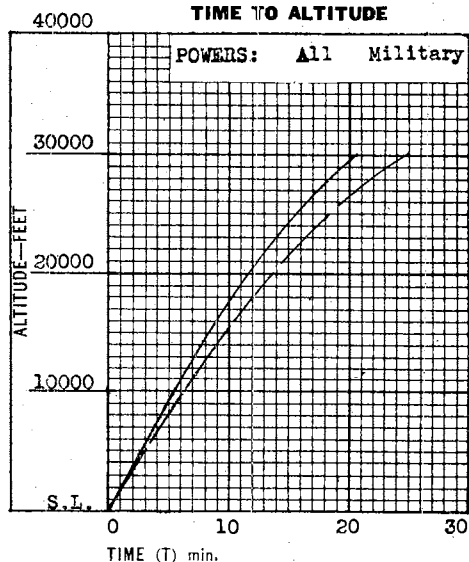
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



DATE December 1944

UNCLASSIFIED

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# PERFORMANCE AND CHARACTERISTICS

UNCLASSIFIED 501A2  
NELL 23

## TAKE-OFF

	Load	Feet
T.O. calm	20400	1837
T.O. 25 kt. wind	20400	717
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 20,400 lbs.	lbs.	Feet	Min.
Rate @ S.L.		1570	1
Rate @ 9,850 ft.		1670	1
Time to 10,000'			6.2
Time to 20,000'			13.5
Service ceiling 34,250'			

## AIRCRAFT

Duty	Medium Bomber
Designation	Type 96, Model 23
Description	Mid-wing Monoplane
Mfg.	Nakajima
Engines	2
Crew	4-7
Construction	All Metal

## SPEED

@ 20400 lbs.	Mph.	Knts.	Altitude
Maximum	215	187	@ S.L.
War Emerg.	228	198	@ S.L.
Maximum	262	227	@ 21,400'
War Emerg.	270	235	@ 19,600'
Cruising 75%	157	136	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	500 kg.	1100
or	2	250 kg.	1100
or	12	30 kg.	792
or	1	800 kg. (Torp)	1760
Maximum			
	1	800 kg.	1760

## ENGINES

	H. P.	Altitude
Take-off	1280	S.L.
Normal		
Military	1180	9,850'
	1085	20,300'
War Emerg.	1355	7,700'

## WEIGHTS

	Lbs.
Empty	10,950
Gross	20,400
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	975	809
Internal (Removable)		
External (drop)		
Maximum	975	809

Mfg.	Mitsubishi
Model	Kinsei 53
Type	Radial
Cylinders	14
Cooling	Air
Supercharger	2 Speed
Propeller	3 Blade Diam. 10.5'
Fuel	C.S.
Take-off	92
Cruising	92
or	87 and methanol.

## RANGE AND RADII

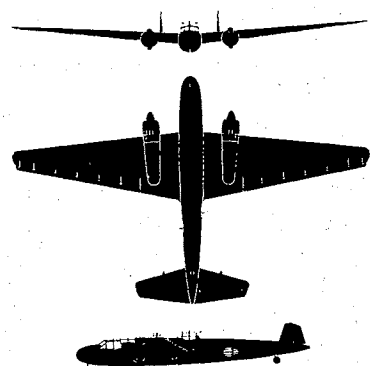
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2550	2214	118	102	1500	956	793	None	None
At 75% Vmax.	2050	1780	159	137	1500	956	793	None	None
Maximum range (normal fuel)	2125	1845	118	102	1500	795	660	1100	None
At 75% Vmax.	1690	1468	157	136	1500	795	660	1100	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span	82'	Length	53.1'
Height		Wing area	862 sq. ft.

## GENERAL DATA

NELL is now used mainly for training and transport. Now obsolescent, this plane played an important role earlier in the war. Torpedo carrying NELLs are credited with the sinking of HMS the Prince of Wales and HMS Repulse.

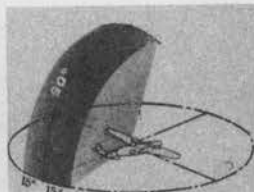


DATE December 1944

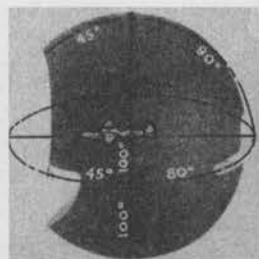
## FIELDS OF FIRE



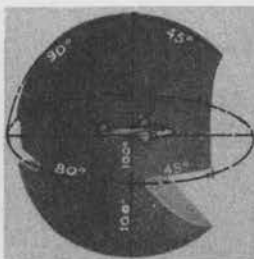
TOP GUN "A"  
1 x 7.7 mm.  
Rear view from above



TOP REAR GUN "B"  
1 x 20 mm.  
Rear view from above



SIDE GUN "C"  
1 x 7.7 mm.  
Side view from above



SIDE GUN "D"  
1 x 7.7 mm.  
Side view from above

## NOTE:

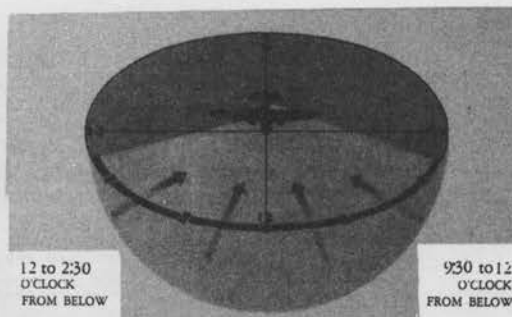
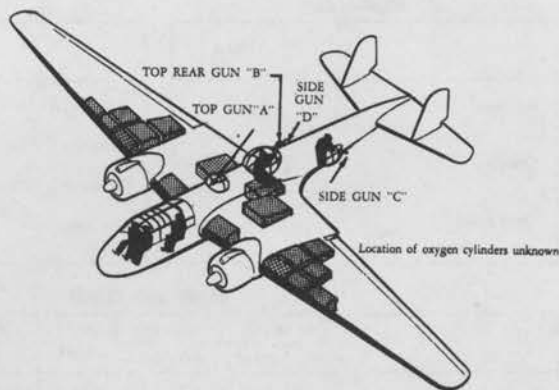
1 x 7.7 mm. FORWARD GUN, aft of pilot and co-pilot, may be fired from port, starboard or bottom positions.

## EXHAUST FLAME PATTERNS



REAR VIEW

## VULNERABILITY

FIELDS OF ATTACK  
Do not attack from above

## LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	1	7.7 mm	300	Flex.	Tail				
Top	1	7.7 mm	300	Flex.	Wing				
Forward	1	20 mm	60	Turret					
Top Aft									
Side	2	7.7 mm	300	Flex.					
Bottom									

## TACTICAL DATA

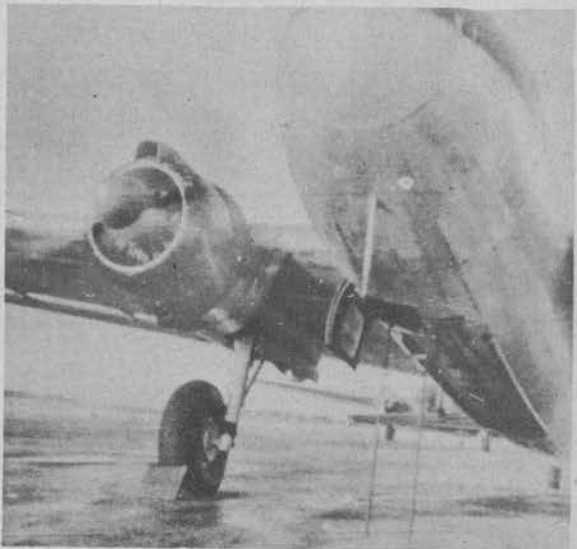
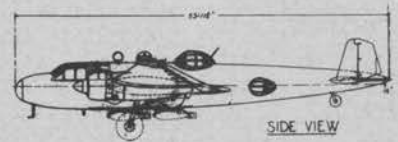
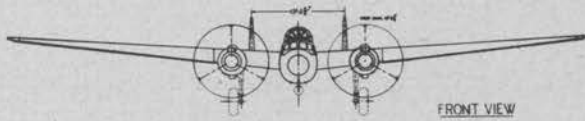
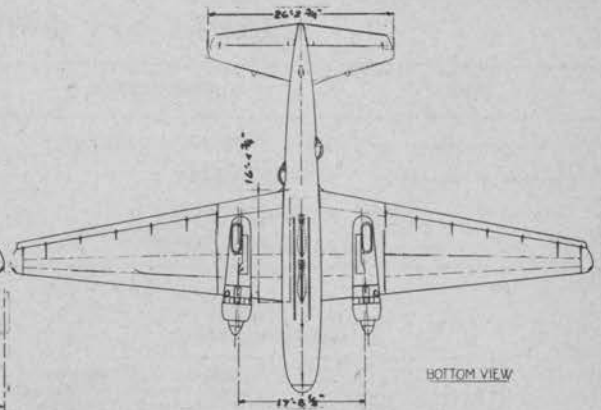
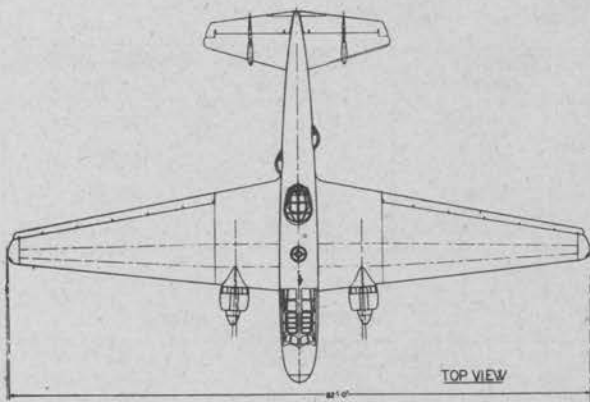
NELL has no armor protection for pilot, crew or engines. Unprotected fuel tanks are another source of weakness.

Forward 7.7 mm may be shifted to forward lateral or ventral positions.

DATE December 1944

RESTRICTED

UNCLASSIFIED 501A-4  
 NELL 23



RESTRICTED

642942 O - 45 - 4

DATE December 1944

UNCLASSIFIED

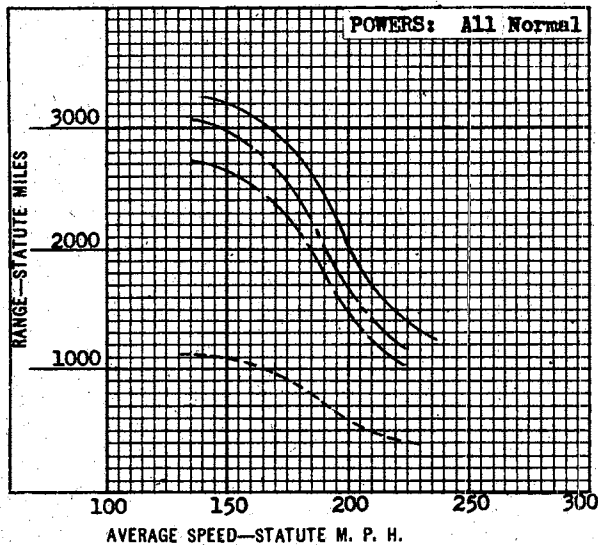


# BETTY 22

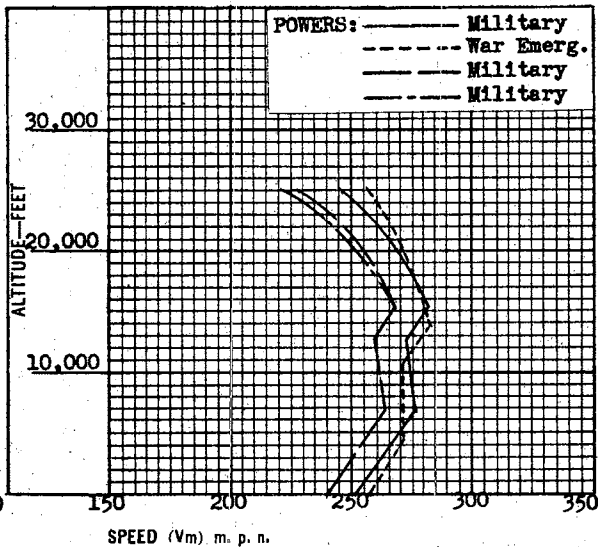
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	MAX. FUEL RECONNAISSANCE	32,300	10,290	None
-----	NORMAL BOMBER	27,570	3450	2205
=====	OVERLOAD BOMBER	33,090	9000	2205
-----	MAX. FUEL BOMBER	34,380	10,290	2205

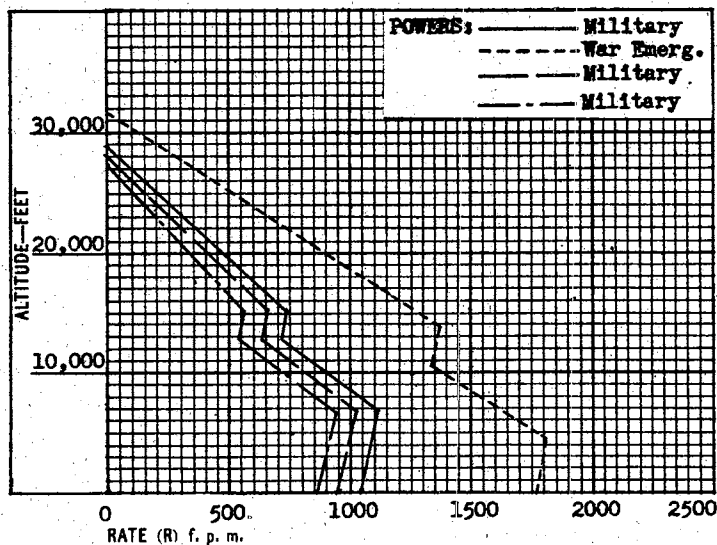
RANGE VS. SPEED



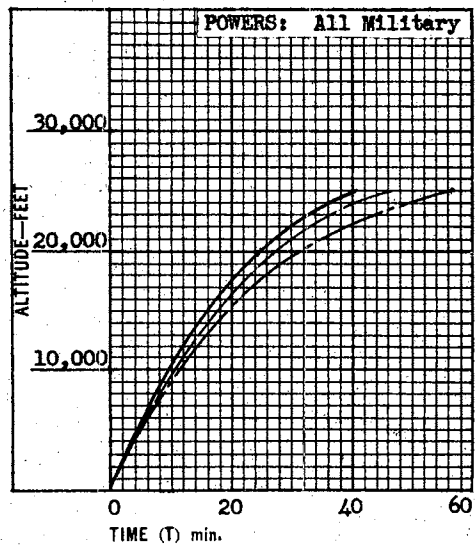
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



# UNCLASSIFIED

# PERFORMANCE AND CHARACTERISTICS

UNCLASSIFIED 502B-2  
BETTY 22

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	34,380	3420
T. O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 27,570 lbs.	Feet	Min
Rate @ S. L.	1770	1
Rate @ 13,800 ft.	1370	1
Time to 10,000'		7.2
Time to 20,000'		17.4
Service ceiling 30,400		

## AIRCRAFT

Duty Bomber - Recco
Designation Type 1, Model 22
Description Mid-wing monoplane
Mfg. Nakajima
Engines 2 Crew 5 - 7
Construction All metal

## SPEED

@ 27,570 lbs.	Mph.	Knts.	Altitude
Maximum	257	221	@ S. L.
Maximum	283	244	@ 13,800'
Cruising - Combat	228	196	@ 1500'
Economical - Cruising	131	114	@ 1500'

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1 x 1000kg Bomb		2200
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	1820	S.L.
Normal	1240	1500'
Military	1655	6800
	1415	15,200
War Emerg.	1880	4400
	1620	13,800

## WEIGHTS

	Lbs.
Empty	17,420
Gross	27,570
Overload	33,090

## FUEL

	U.S. gal.	Imp. gal.
Built-in	1715	1428
Internal (Removable)		
External (drop)		
Maximum	1715	1428

Mfg. Mitsubishi
Model Kasei 21
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 4 Bl. C.S. Diam. 11.16'
Fuel-Take-off 92 Cruising 92 plus ADI

## RANGE AND RADIUS

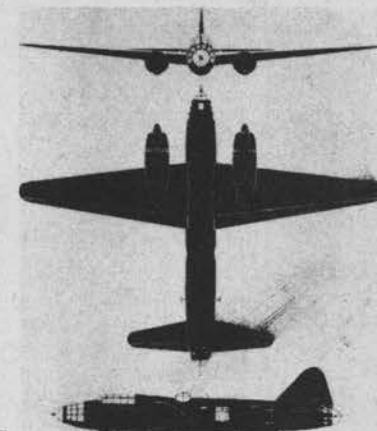
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	3075	2670	136	116	1500	1715	1428	2200	None
Range @ Combat Cr	1170	1016	226	195	1500	1715	1428	2200	None
Maximum range (normal fuel)	1125	977	131	114	1500	575	479	2200	None
Range @ Combat Cr Radius ( )	395	343	228	196	1500	575	479	2200	None
Radius ( )									

## DIMENSIONS

Span 82'	Length 64.5'
Height 15'7"	Wing area 840 sq. ft.

## GENERAL DATA

BETTY 22 is radar equipped and carries "window" (Radar Interference).  
The size of the bomb bay would permit carrying of two 1760 lbs. torpedoes although specifications call for one only.  
Side blisters are replaced by ports and the transparent area of the nose section is increased. Three types of tail cones have been found.  
BETTY 22 is used to carry the pilot directed suicide bomb



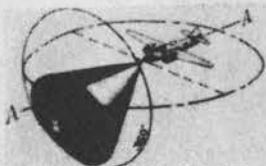
RESTRICTED

DATE May 1945

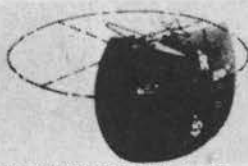
UNCLASSIFIED

## BETTY 22

## FIELDS OF FIRE



FORWARD GUN "A" 1 x 7.7 mm.  
 $\frac{1}{4}$ -front view from above  
 Nose rotates mechanically thru 360° about axis "A"—"A". Gun is ball and socket mounted, off center, in nose.



FORWARD GUN "B" 1 x 7.7 mm.  
 $\frac{1}{4}$ -front view from above  
 This gun is interchangeable from port to starboard side of nose. Ball and socket mount.



TOP GUN "C" 1 x 20 mm.  
 $\frac{1}{4}$ -rear view from above  
 Powered turret



SIDE GUN "D" 1 x 7.7 mm.  
 Approx. side view from above.  
 Post and sliding bar mount.  
 Field of fire for SIDE GUN "E" similar.



TAIL GUN "F" 1 x 20 mm.  
 $\frac{1}{4}$ -rear view from above

## FIRE FREE FIELDS



$\frac{1}{4}$ -front view from above



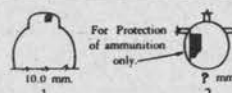
$\frac{1}{4}$ -front view from below.

## EXHAUST FLAME PATTERNS



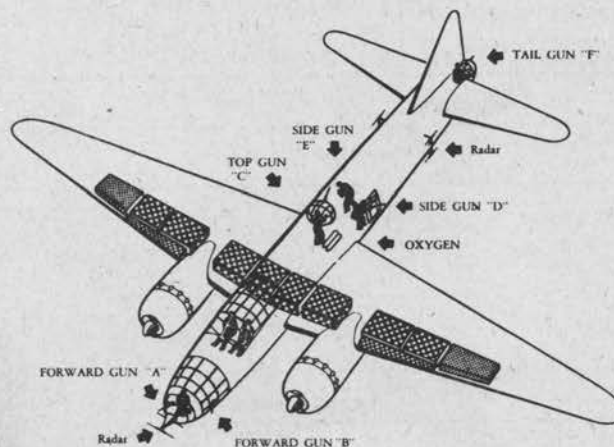
REAR VIEW

## ARMOR PLATE



Viewed from rear

## VULNERABILITY



## LEGEND

Fuel tanks, unprotected  
 Fuel tanks, protected

Oil tanks, unprotected  
 Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	1	7.7mm	7x97	Type 92 Flexible, (Lewis)
Cheek (Aux.)	1	7.7mm	?	Type 92 Flexible, (Lewis)
Top	1	20 mm	6x45	Type 99 Mk.1 (Oerlikon) in power turret
Side	2	7.7mm	6x97	Type 92 Flexible, (Lewis)
or	2	20 mm	?	Type 99 Flexible, (Oerlikon)
Tail	1	20 mm	6x45	Type 99 Flexible, (Oerlikon)

## TACTICAL DATA

13 mm Type 2 Flexible guns are expected to replace the 7.7 mm guns in the nose and side positions. 20 mm guns have been used in the side positions but the mount is not designed for them. Power operated dorsal turret.

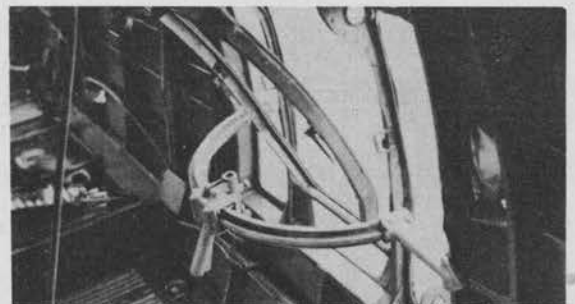
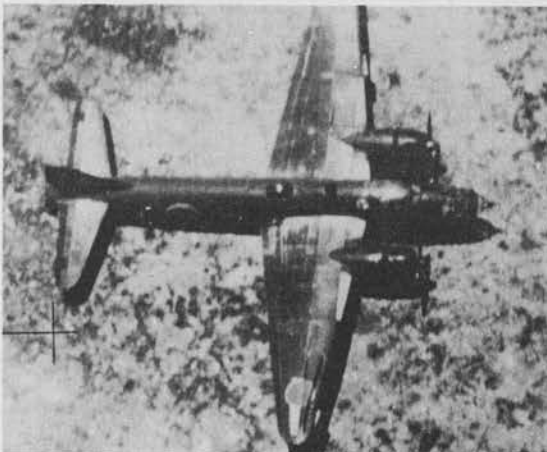
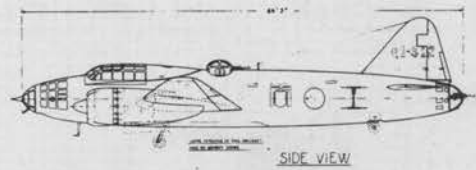
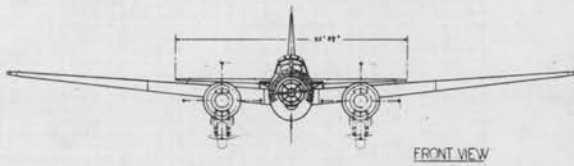
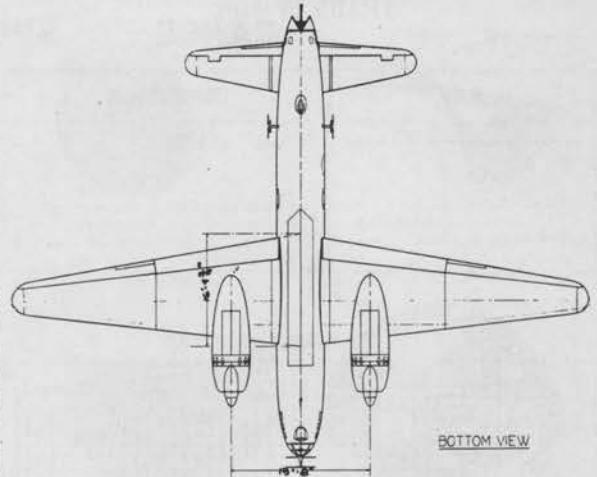
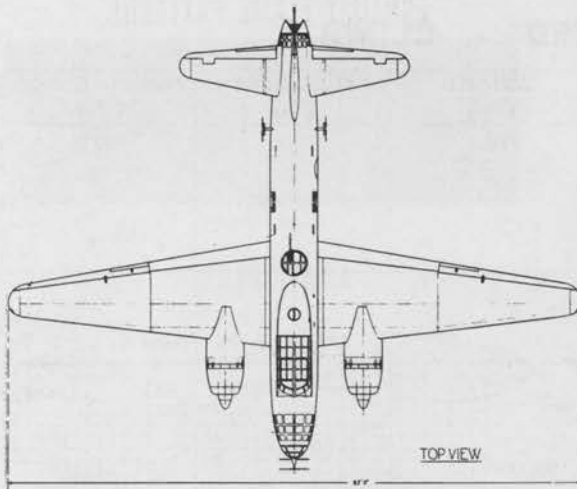
DATE June 1945

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# UNCLASSIFIED 502B-4

## BETTY 22



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DATE December 1944

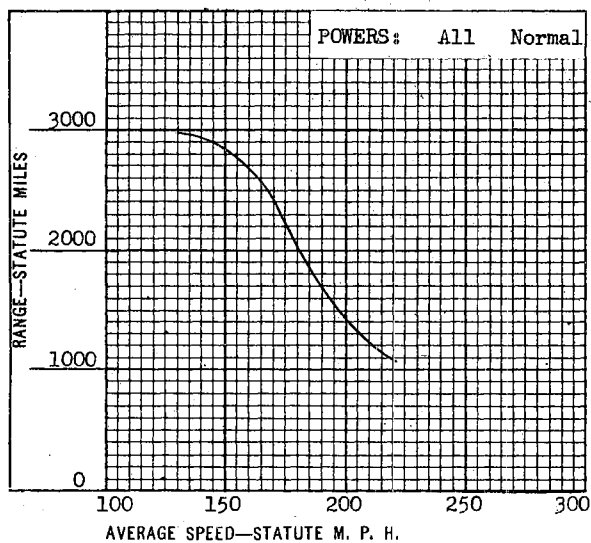
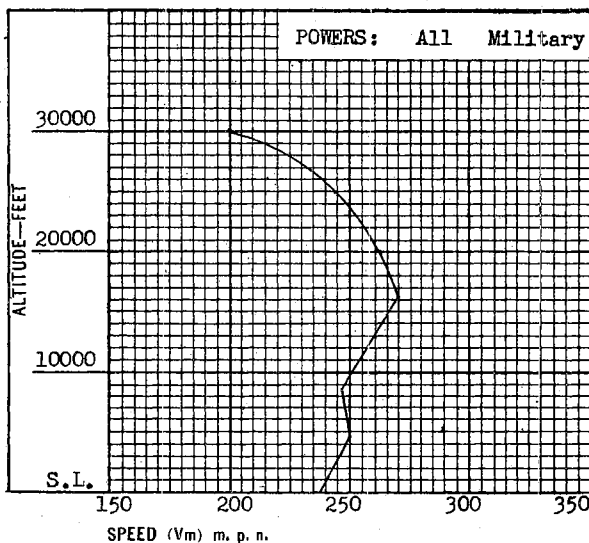
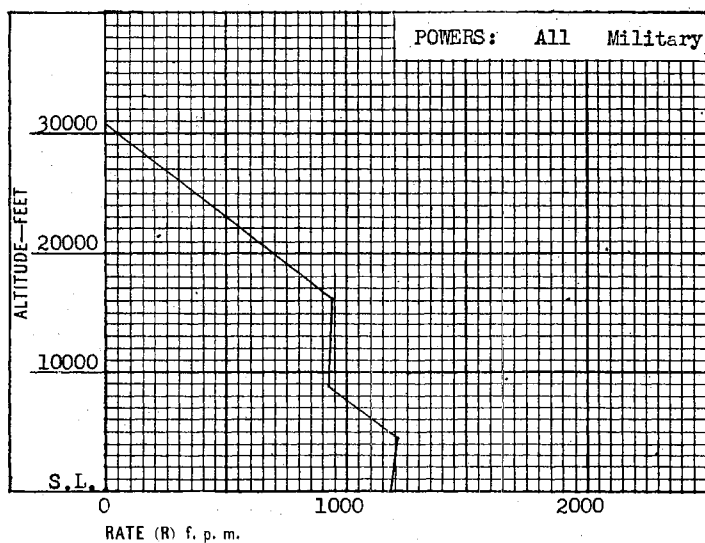
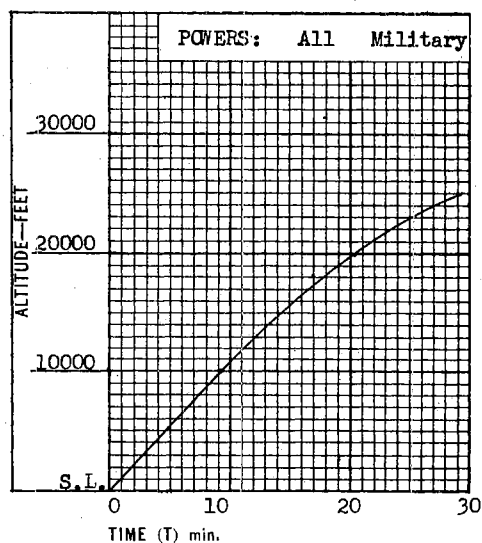
UNCLASSIFIED

LIZ 11

UNCLASSIFIED

**RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
	NORMAL BOMBER	75000	21000	7240

**RANGE VS. SPEED****SPEED VS. ALTITUDE****RATE OF CLIMB****TIME TO ALTITUDE**

DATE December 1944

UNCLASSIFIED

RESTRICTED

# PERFORMANCE AND CHARACTERISTICS

## TAKE-OFF

	Load	Feet
T.O. calm	75000	1445
T.O. 25 kt. wind	75000	658
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@ 75,000	lbs.	Feet	Min.
Rate @ S.L.		1180	1
Rate @ 4,600 ft.		1205	1
Time to 10,000'			9.1
Time to 20,000'			20.4
Service ceiling 29,100'			

## AIRCRAFT

Duty Heavy Bomber
Designation Type 2, Model 11*
Description Mid-wing Monoplane
Mfg. Mitsubishi
Engines 4 Crew
Construction All Metal

## SPEED

@ 75000 lbs.	Mph.	Knts.	Altitude
Maximum	238	207	@ S. L.
Maximum	270	235	@ 16,100'
Cruising 75%	166	144	1,500'
Economical			

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	3	800 kg. (Torps)	
or	2	1500 kg.	
or	4	800 kg.	
or	12	250 kg.	
	4	800 kg. Bombs	7040

## ENGINES

	H. P.	Altitude
Take-off	1850	S.L.
Normal		
Military	1730	4,600'
War Emerg.	1580	16,100'

## WEIGHTS

	Lbs.
Empty	40,000
Gross	75,000
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	3500	2905
Internal (Removable)		
External (drop)		
Maximum	3500	2905

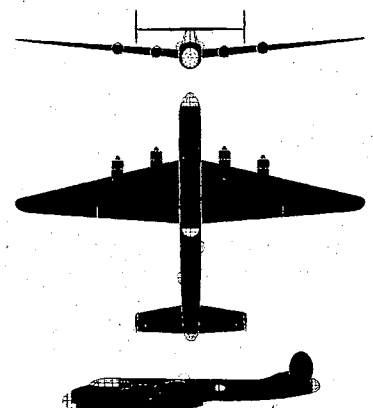
Mfg. Nakajima  
Model Mamoru 12  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger 2 Speed  
Propeller 4 Blade Diam. 13.0'  
C.S.  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2990	2676	129	111	1500	3500	2905	7040	None
At 75% Vmax.	2540	2205	166	144	1500	3500	2905	7040	None
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 138.3'	Length 101.7'
Height	Wing area 2230 sq.ft.



## GENERAL DATA

This plane has apparently proven unsatisfactory as a heavy bomber and is now used as transport.

Gross and empty weights, fuel capacity, and propeller diameter are estimated.

\* Has also been listed as Model 12

DATE December 1944



503A-3

LIZ 11

UNCLASSIFIED

Vulnerability, Fields of Fire, etc.

ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

TACTICAL DATA

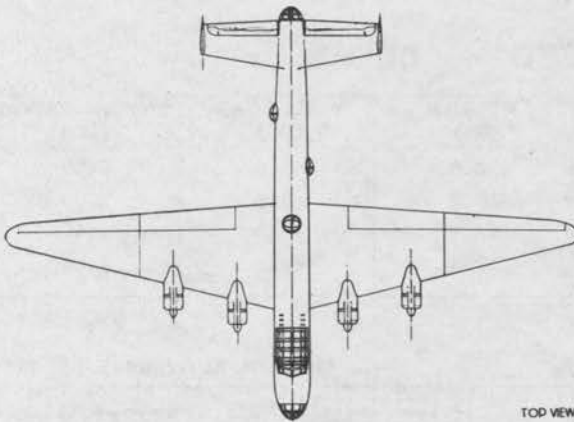
No information available.

DATE December 1944

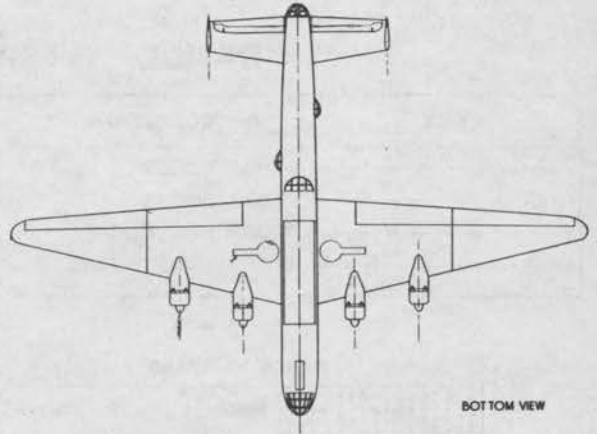
UNCLASSIFIED

UNCLASSIFIED 503A-4

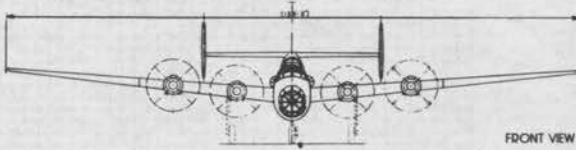
LIZ 11



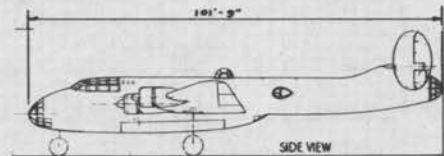
TOP VIEW



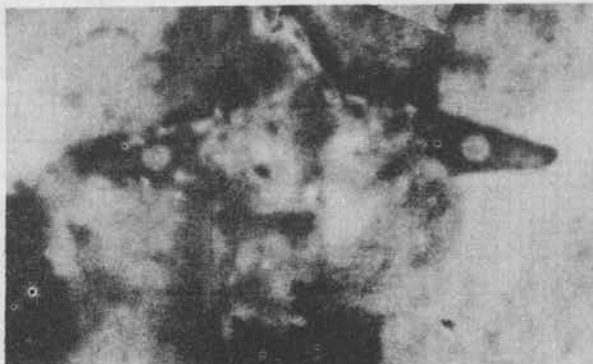
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



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DATE December 1944

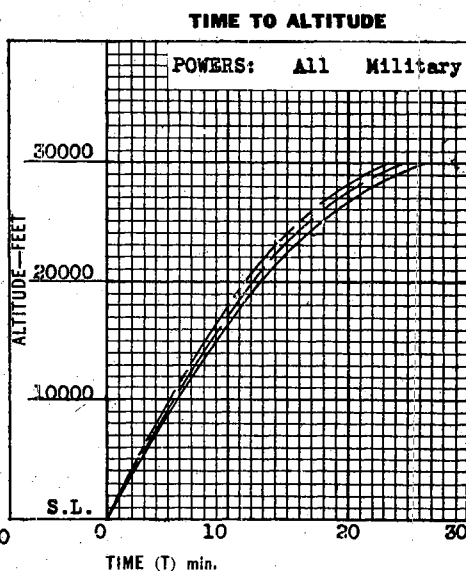
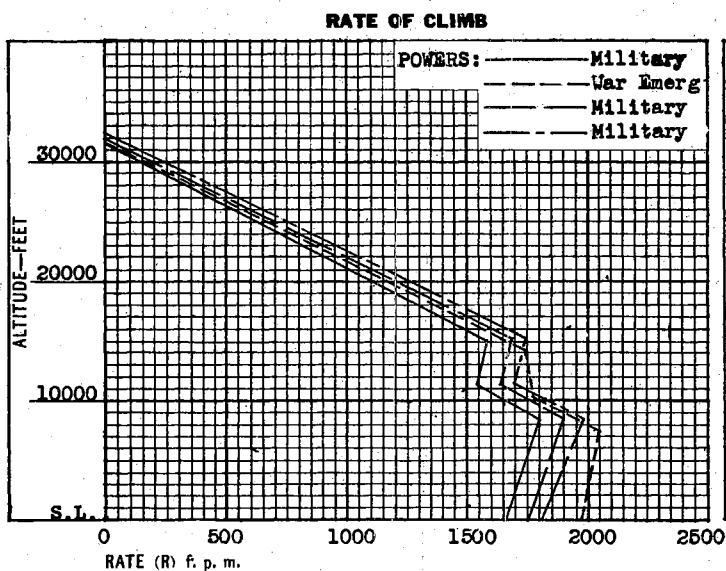
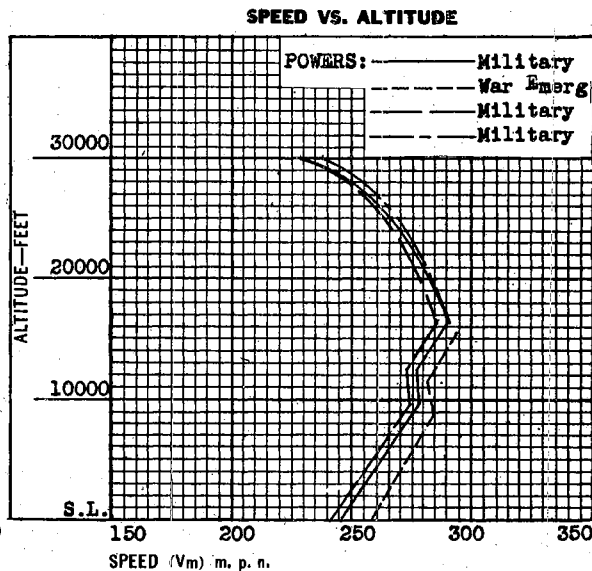
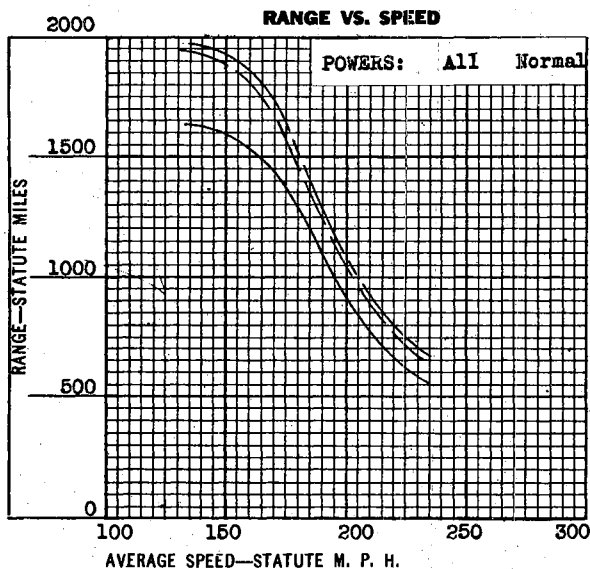
UNCLASSIFIED

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## SALLY 2

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
—————	NORMAL BOMBER	23500	4146	2200
-----	NORMAL BOMBER	23500	4146	2200
—————	BOMBER Max. Fuel	22604	4932	440
-----	RECONNAISSANCE (Max. Fuel)	22164	4932	None



DATE December 1944

UNCLASSIFIED

RESTRICTED

# PERFORMANCE AND CHARACTERISTICS

UNCLASSIFIED 551A-2  
SALLY 2

## TAKE-OFF

	Load	Feet
T.O. calm	23500	900
T.O. 25 kt. wind	23500	388
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 23500 lbs.	Feet	Min.
Rate @ S.L.	1665	1
Rate @ 8550 ft.	1800	1
Time to 10,000'		5.8
Time to 20,000'		12.6
Service ceiling 30,500'		

## AIRCRAFT

Duty Medium Bomber
Designation Ki 57, Type 97
Description Low Mid-wing Monoplane
Mfg. Mitsubishi
Engines 2 Crew 4-7
Construction All Metal

## SPEED

@ 23500 lbs.	Mph.	Knts.	Altitude
Maximum	246	213	@ S. L.
War Emerg.	258	223	@ S. L.
Maximum	291	252	@ 16,400'
War Emerg.	294	255	@ 15,400'
Cruising 75%	176	153	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	16	50 kg	1760
or	9	100 kg	1980
or	4	250 kg	2200
or	2	500 kg	2200
Maximum	2	500 kg.	2200

## ENGINES

	H. P.	Altitude
Take-off	1490	S.L.
Normal		
Military	1445	8,550'
	1360	15,100'
War Emerg.	1580	7,500'

## WEIGHTS

	Lbs.
Empty	
Gross Normal Bomber	23500
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	691	573
Internal (Removable)	131	109
External (drop)		
Maximum	822	682

Mfg. Mitsubishi
Model Type 100, 1450 h.p.
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 Blade Diam. 11.1' C.S.
Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

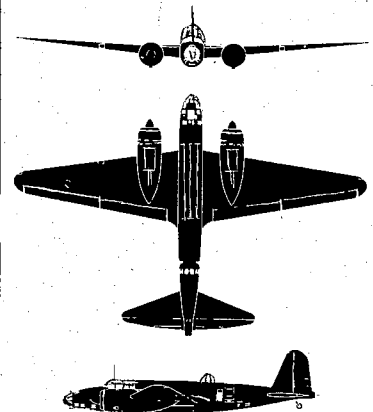
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1945	1689	132	114	1500	822	682	440	None
At 75% Vmax.	1595	1385	174	151	1500	822	682	440	None
Maximum range (normal fuel)	1635	1420	133	115	1500	691	573	2200	None
At 75% Vmax.	1350	1172	176	153	1500	691	573	2200	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 74.6'	Length 53'
Height	Wing area 768sq.ft.

## GENERAL DATA

SALLY with the dorsal turret has at times been designated as SALLY 3. It is now determined that the proper designation is SALLY 2. For maximum fuel condition an internal tank is carried in the bomb bay and four x 50 kg. bombs are carried externally. SALLY is being replaced by PEGGY.



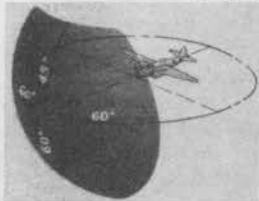
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DATE December 1944

UNCLASSIFIED

UNCLASSIFIED  
SALLY 2

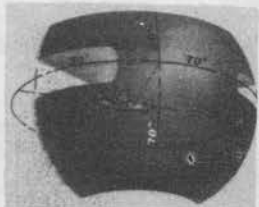
## FIELDS OF FIRE



FORWARD GUN "A" 1 x 7.9 mm.  
¾-front view from above  
Alternate, 1 x 7.7 mm.



TOP GUN "B" 1 x 12.7 mm.  
¾-rear view from above  
Manually operated turret



SIDE GUN "C" 1 x 7.9 mm.  
Approx. side view from below.  
Field of fire for SIDE GUN "D" similar  
Alternate, 1 x 7.7 mm.



BOTTOM GUN "E" 1 x 7.9 mm.  
¾-rear view from below.  
Alternate, 1 or 2 x 7.7 mm.



TAIL GUN "F" 1 x 7.7 mm.  
¾-rear view from above  
Remote controlled by turret gunner.

## FIRE FREE FIELDS

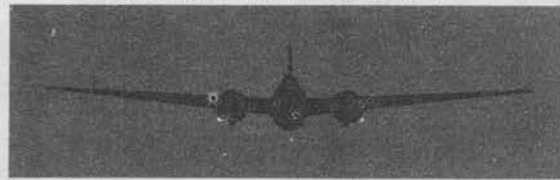


¾-front view from above



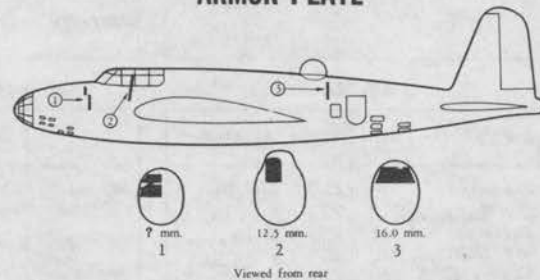
¾-rear view from below.

## EXHAUST FLAME PATTERNS



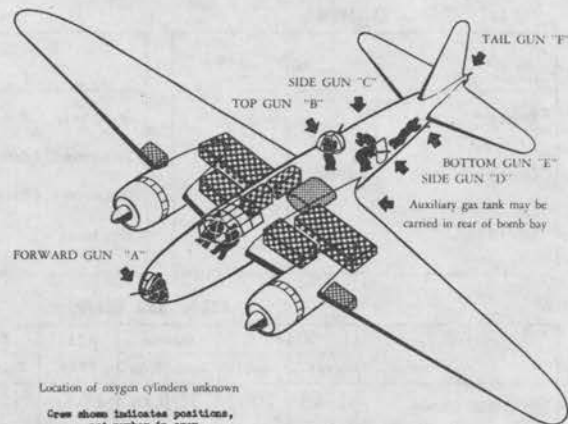
REAR VIEW

## ARMOR PLATE



Viewed from rear

## VULNERABILITY



Location of oxygen cylinders unknown

Crew shows indicator positions,  
not number in crew.

## LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	1	7.9 mm	600	Flex.	Tail	1	7.7 mm	600	Flex.
Top	1	12.7 mm	600	Turret	Wing				
Side	2	7.9 mm	600	Flex.					
Bottom	1	7.9 mm	600	Flex.					

## TACTICAL DATA

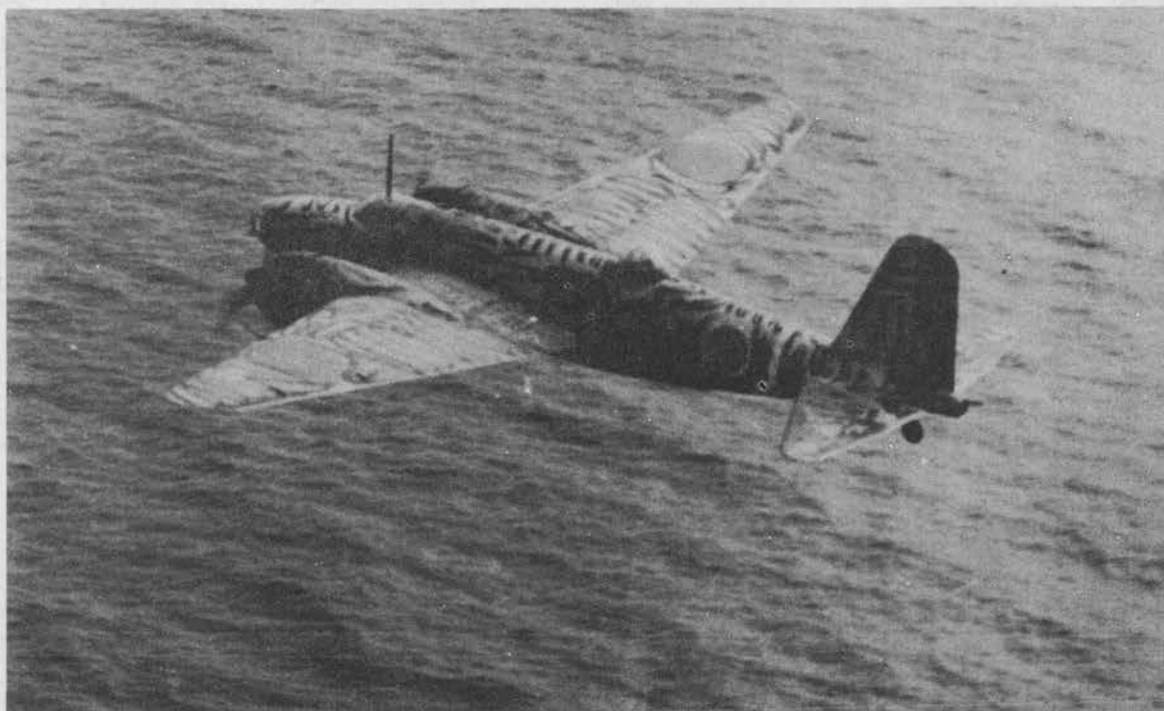
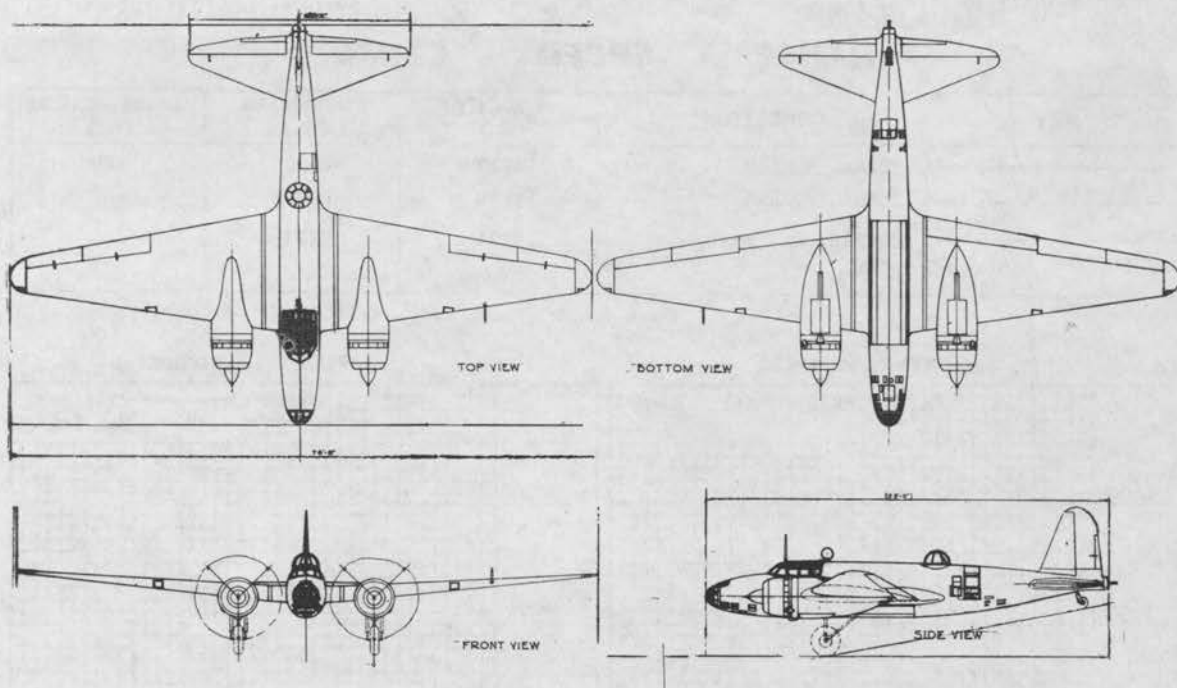
Fuel tanks have partial leak protection with rubber laminated covering. Armor plates are found around the dorsal turret.

Top turret is bicycle pedal operated in traverse.

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UNCLASSIFIED 551A-4  
SALLY 2



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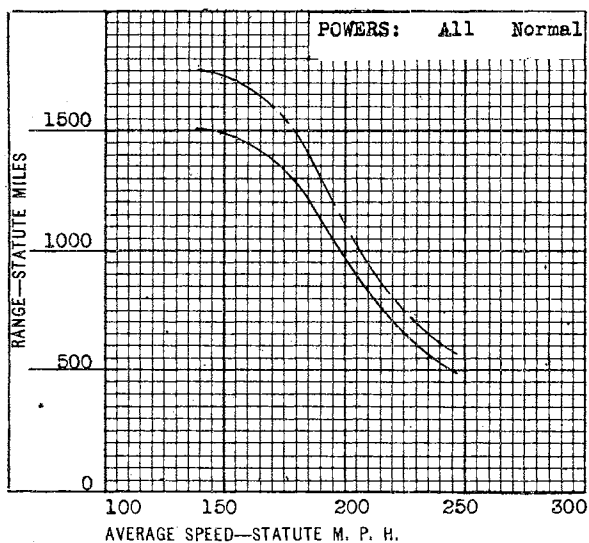
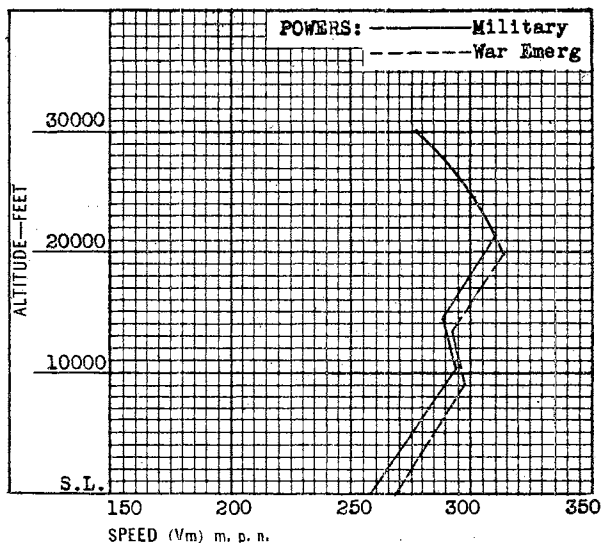
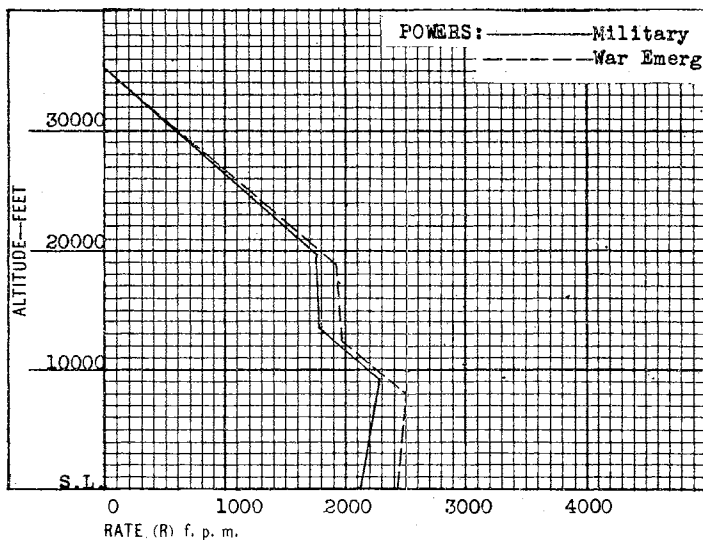
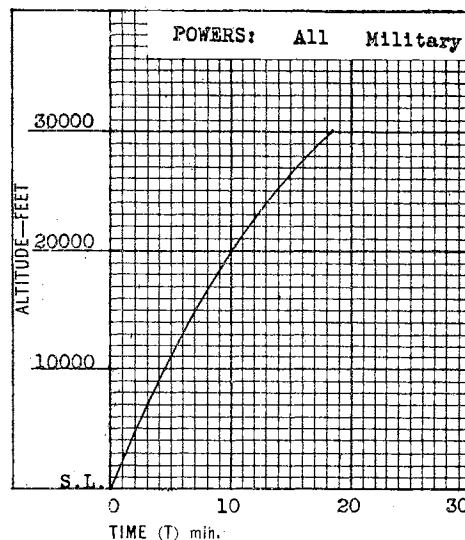


LILY 2

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**RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL BOMBER	14730	2670	880
-----	NORMAL BOMBER	14730	2670	880
-----	BOMBER Max. Fuel	14774	3104	440

**RANGE VS. SPEED****SPEED VS. ALTITUDE****RATE OF CLIMB****TIME TO ALTITUDE**

DATE December 1944

UNCLASSIFIED

RESTRICTED

# PERFORMANCE AND CHARACTERISTICS

UNCLASSIFIED 552A-2  
LILY 2

## TAKE-OFF

	Load	Feet
T.O. calm	14730	806
T.O. 25 kt. wind	14730	364
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@ 14,730 lbs.	lbs.	Feet	Min.
Rate @ S.L.		2120	1
Rate @ 9,200 ft.		2280	1
Time to 10,000'			4.6
Time to 20,000'			10.0
Service ceiling 34,300'			

## AIRCRAFT

Duty Light Bomber
Designation Ki 48, Type 99
Description Low-Mid-wing Monoplane
Mfg. Kawasaki
Engines 2 Crew 4-5
Construction All Metal

## SPEED

@ 14,730 lbs.	Mph.	Knts.	Altitude
Maximum	258	223	@ S.L.
War Emerg.	268	233	@ S.L.
Maximum	310	269	@ 20,700'
War Emerg.	313	271	@ 19,900'
Cruising 75% 185		160	1,500'
Economical			

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	6	50 kg.	660
or	4	50 kg.	440
or	4	100 kg.	880
Maximum	4	100 kg.	880

## ENGINES

	H. P.	Altitude
Take-off	1105	S.L.
Normal		
Military	1085	9,200'
	965	19,700'
War Emerg.	1165	8,000'

## WEIGHTS

	Lbs.
Empty	9790
Gross Normal Bomber	14730
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	445	369
Internal (Removable)	73	61
External (drop)		
Maximum	518	430

Mfg. Kawasaki and Nakajima  
Model Type 2, 1150 h.p.  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger 2 Speed  
Propeller 3 Blade Diam. 9.5'  
Fuel - Take-off 92 Cruising 92

## RANGE AND RADIUS

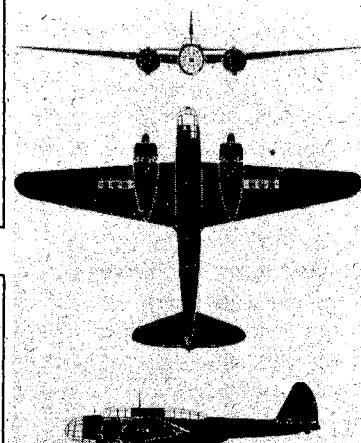
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1750	1520	139	120	1500	518	430	440	None
At 75% Vmax.	1410	1225	185	160	1500	518	430	440	None
Maximum range (normal fuel)	1505	1307	138	120	1500	445	369	880	None
At 75% Vmax.	1215	1055	185	160	1500	445	369	880	None
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 57.3'	Length 42.1'
Height	Wing area 452 sq.ft.

## GENERAL DATA

LILY has seen long service with the Japanese Army Air Force. Recently this plane has undergone a number of modifications. Dive brakes have been added but are seldom used. Armor plate is installed plus heavier fire power including a 12.7 mm gun in dorsal turret.



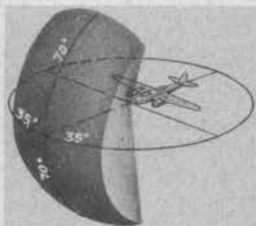
DATE December 19/44

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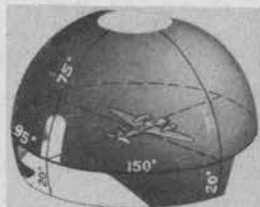
552A-3

LILY 2

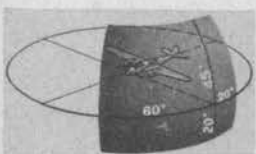
## FIELDS OF FIRE



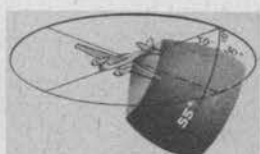
FORWARD GUN "A" 1 x 7.9 mm.  
3/4-front view from above



TOP GUN "C" 1 x 12.7 mm.  
3/4-rear view from above  
Manually operated turret



FORWARD GUN "B" 1 x 7.9 mm.  
3/4-front view from above  
This gun is interchangeable from  
port to st'b'd. side of nose.

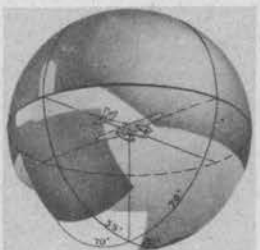


BOTTOM GUN "D"  
1 x 7.9 mm. or 2 x 7.7 mm.  
3/4-rear view from below.

## FIRE FREE FIELDS



3/4-front view from above



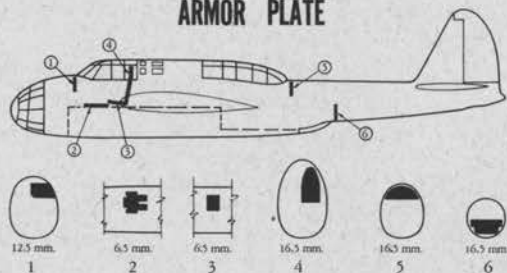
3/4-rear view from below.

## EXHAUST FLAME PATTERNS



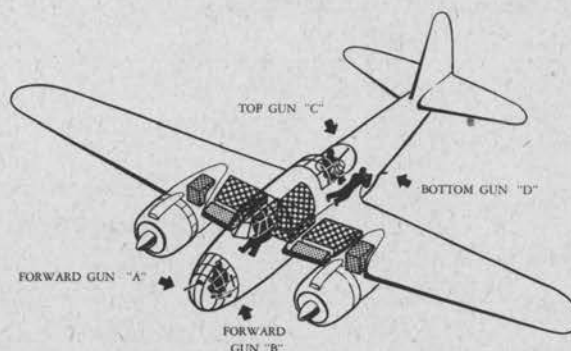
REAR VIEW

## ARMOR PLATE



Viewed from front and above

## VULNERABILITY



## LEGEND

Fuel tanks, unprotected  
Fuel tanks, protected

Oil tanks, unprotected  
Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	1	7.9 mm	525	Flex.	Tail				
Top	1	12.7 mm	700	Hand Turret	Wing				
Side									
Aux. Nose	1	7.9 mm		Flex.					
Bottom	1	7.9 mm	525	Flex.					

## TACTICAL DATA

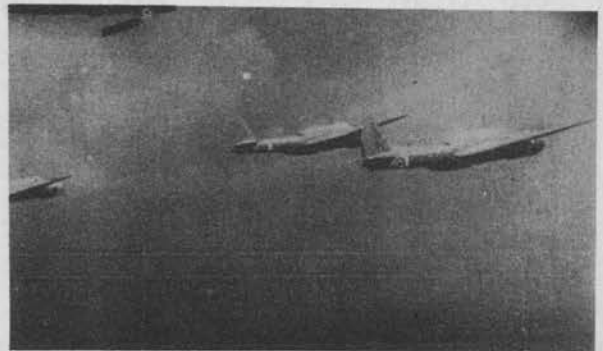
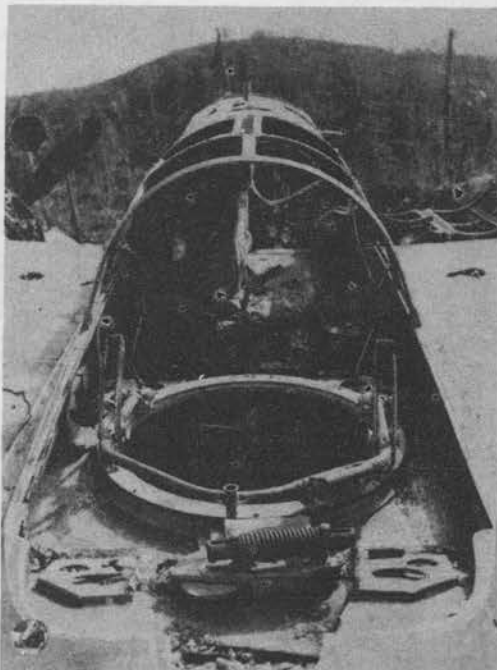
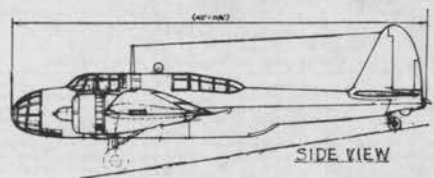
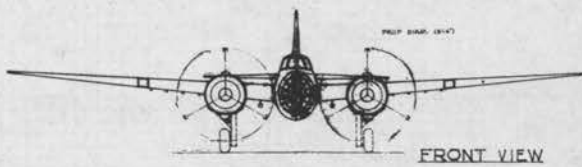
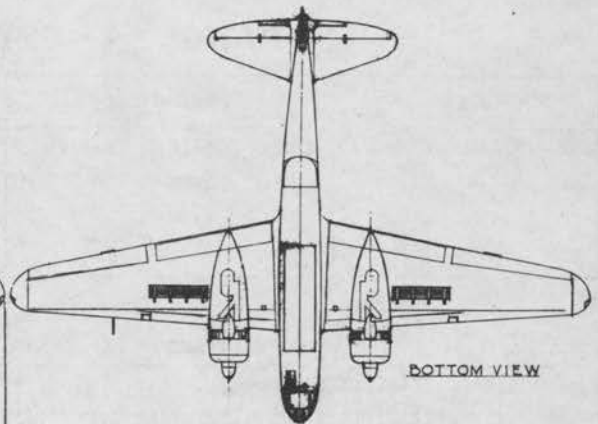
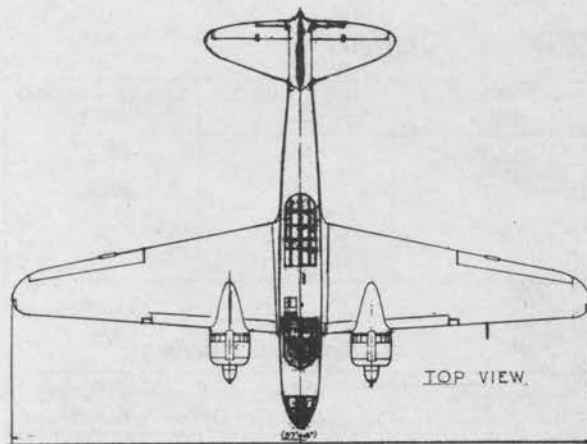
LILY is heavily armored. In addition to pilot protection, plates are installed aft for the gunner.

Fuel tank protection is installed.

DATE March 1945

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552A-4  
**UNCLASSIFIED**  
**LILY 2**



**RESTRICTED**

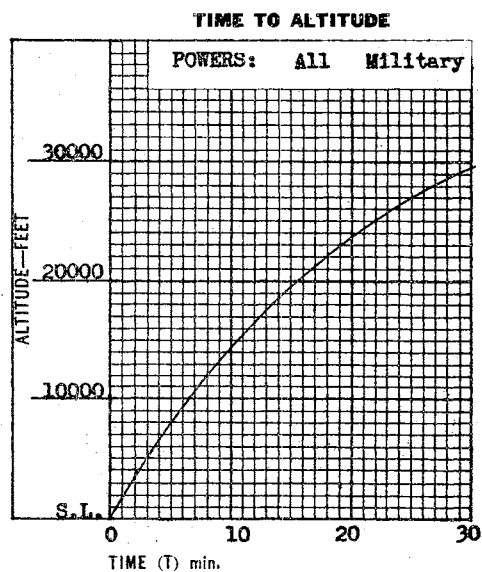
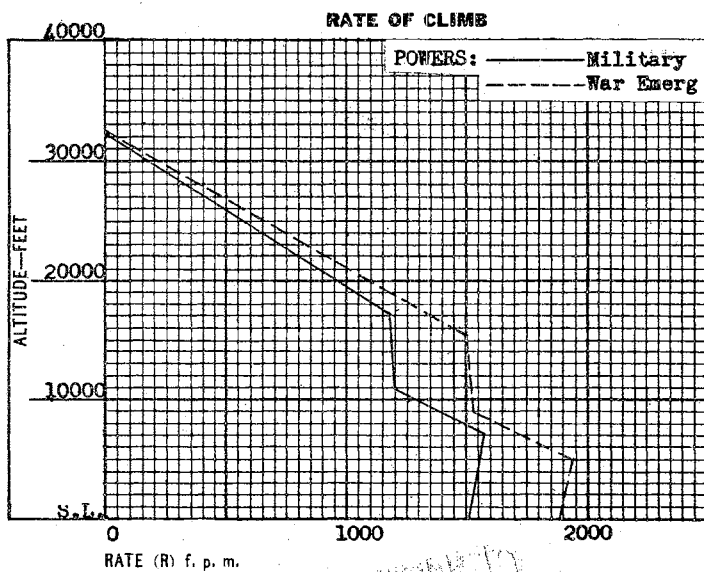
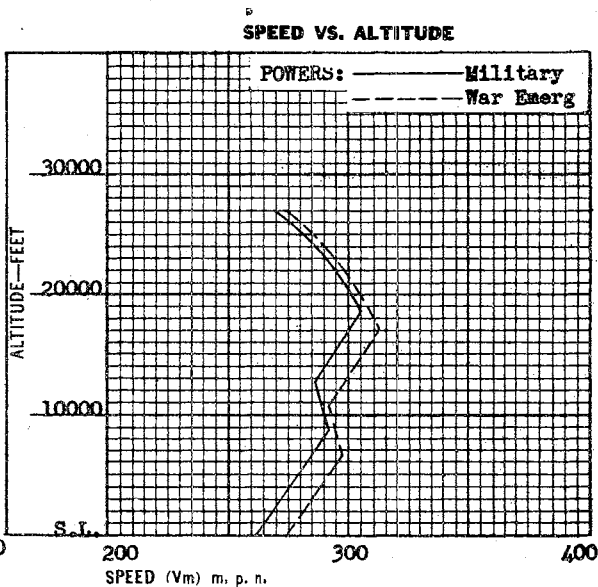
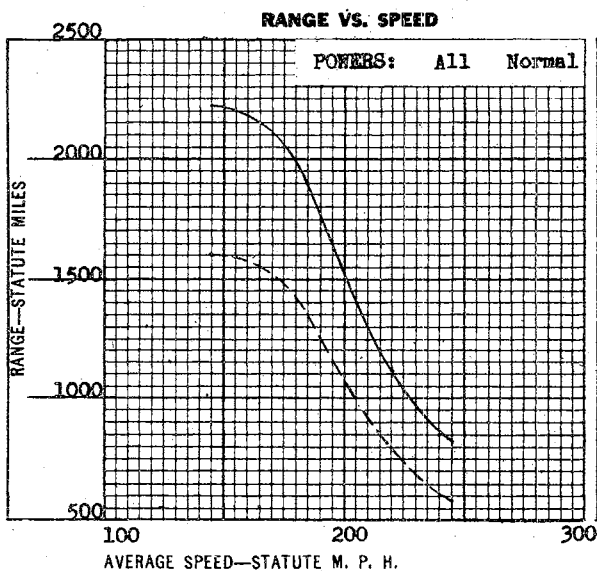
DATE December 1944

**UNCLASSIFIED**

HELEN 2

# RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	BOMBER OVERLOAD (Max Fuel)	24400	5544	1654
-----	NORMAL BOMBER	23523	3962	2205


 UNCLASSIFIED  
 DATE December 1944

UNCLASSIFIED 553A.2

## PERFORMANCE AND CHARACTERISTICS

## HELEN 2

## TAKE-OFF

	Load	Feet
T.O. calm	23523	881
T.O. 25 kt. wind	23523	432
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB—CEILING

@ 24,400 lbs.	Feet	Min.
Rate @ S.L.	1505	1
Rate @ 5,000 ft.	1580	1
Time to 10,000'		6.6
Time to 20,000'		15.2
Service ceiling 30,930'		

## AIRCRAFT

Duty	Medium Bomber
Designation	Type 100, Model 2
Description	Mid-wing Monoplane
Mfg.	Nakajima
Engines	2
Crew	7
Construction	All metal

## SPEED

@ 23523 lbs.	Mph.	Knts.	Altitude
War Emerg. Maximum	274	238	@ S.L.
War Emerg. Maximum	262	227	@ S.L.
War Emerg. Maximum	312	271	@ 16,900'
War Emerg. Maximum	305	264	@ 18,700'
Cruising 75%	184	159	1,500'
Economical			

## BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	2	500 kg.	2200
or	4	250 kg.	2200
or	6	100 kg.	1320
or	9	50 kg.	990
Maximum	4	250 kg.	2200

## ENGINES

	H. P.	Altitude
Take-off	1500	S.L.
Normal		
Military	1420	7,000'
Military	1300	17,200'
War Emerg.	1570	5,000'

## WEIGHTS

	Lbs.
Empty	14730
Gross	23523
Overload (Max. Fuel)	24400

## FUEL

	U.S. gal.	Imp. gal.
Built-in	661	549
Internal (Removable)	263	218
External (drop)		
Maximum	924	767

Mfg. Nakajima  
Model Type 2, 1450 h.p.  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger 2 Speed  
Propeller 3 Blade Diam. 10.8' C.S.  
Fuel - Take-off 92 Cruising 92 or 87 plus methanol

## RANGE AND RANGE

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2220	1928	145	126	1500	924	767	1650	None
At 75% Vmax.	1915	1663	184	159	1500	924	767	1650	None
Maximum range (normal fuel)	1605	1393	146	127	1500	661	549	2200	None
At 75% Vmax.	1375	1194	184	159	1500	661	549	2200	None
Radius ( )									
Radius ( )									

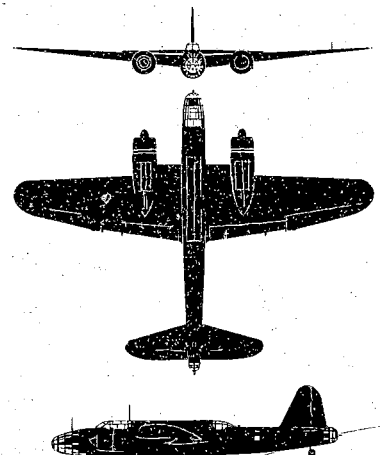
## DIMENSIONS

Span 66.6'	Length 54'
Height	Wing area 684 sq. ft.

## GENERAL DATA

HELEN uses the same engine as TOJO. At present this plane is one of the most widely used of all Japanese Army bombers.

Climb figures are computed with an overload condition.



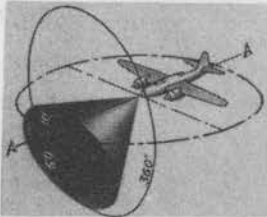
DATE December 1944

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## HELEN 2

## FIELDS OF FIRE



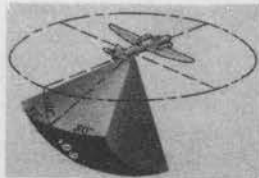
FORWARD GUN "A" 1 x 12.7 mm.  
 $\frac{1}{4}$ -front view from above  
 Turret can be rotated manually thru  
 360° about axis "A"-A  
 Alternate nose gun 1 x 7.7 mm.



TOP GUN "B" 1 x 20 mm.  
 $\frac{1}{4}$ -rear view from above



SIDE GUN "C" 1 x 7.9 mm.  
 Approx. side view from above  
 Field of fire for SIDE GUN "D" similar

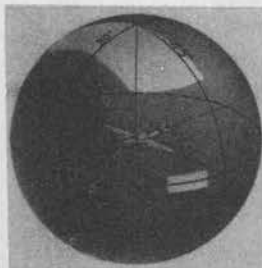


BOTTOM GUN "E" 1 x 7.9 mm.  
 $\frac{1}{4}$ -rear view from above

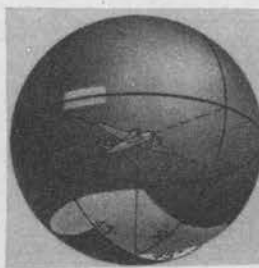


TAIL GUN "F" 1 x 12.7 mm.  
 $\frac{1}{4}$ -rear view from above

## FIRE FREE FIELDS

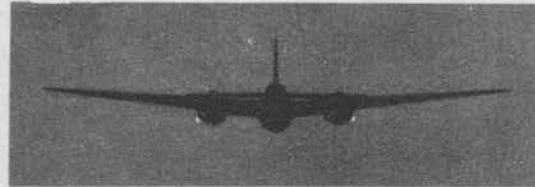


$\frac{1}{4}$ -front view from above



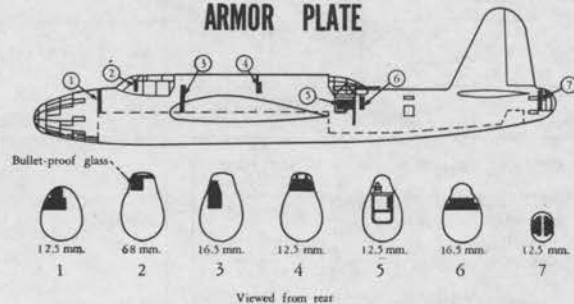
$\frac{1}{4}$ -front view from below

## EXHAUST FLAME PATTERNS

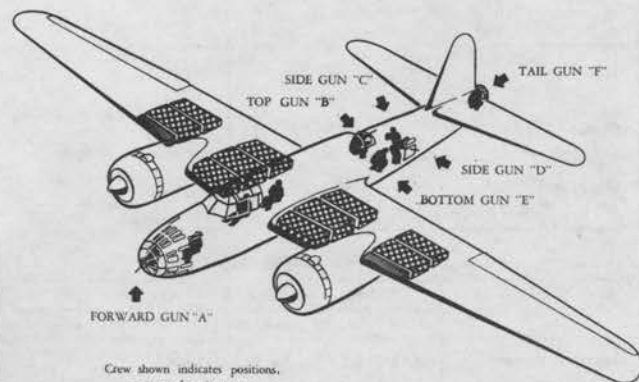


REAR VIEW

## ARMOR PLATE



## VULNERABILITY



## LEGEND

Fuel tanks, unprotected

Oil tanks, unprotected

Fuel tanks, protected

Oil tanks, protected

## ARMAMENT

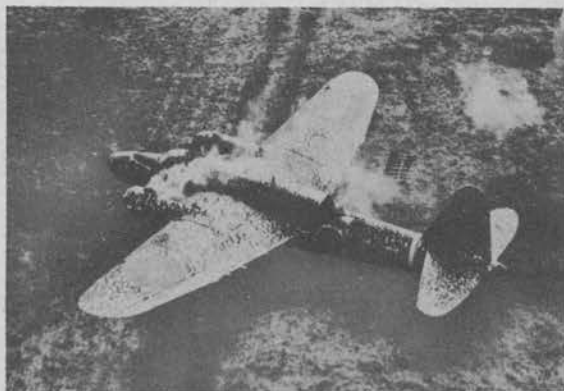
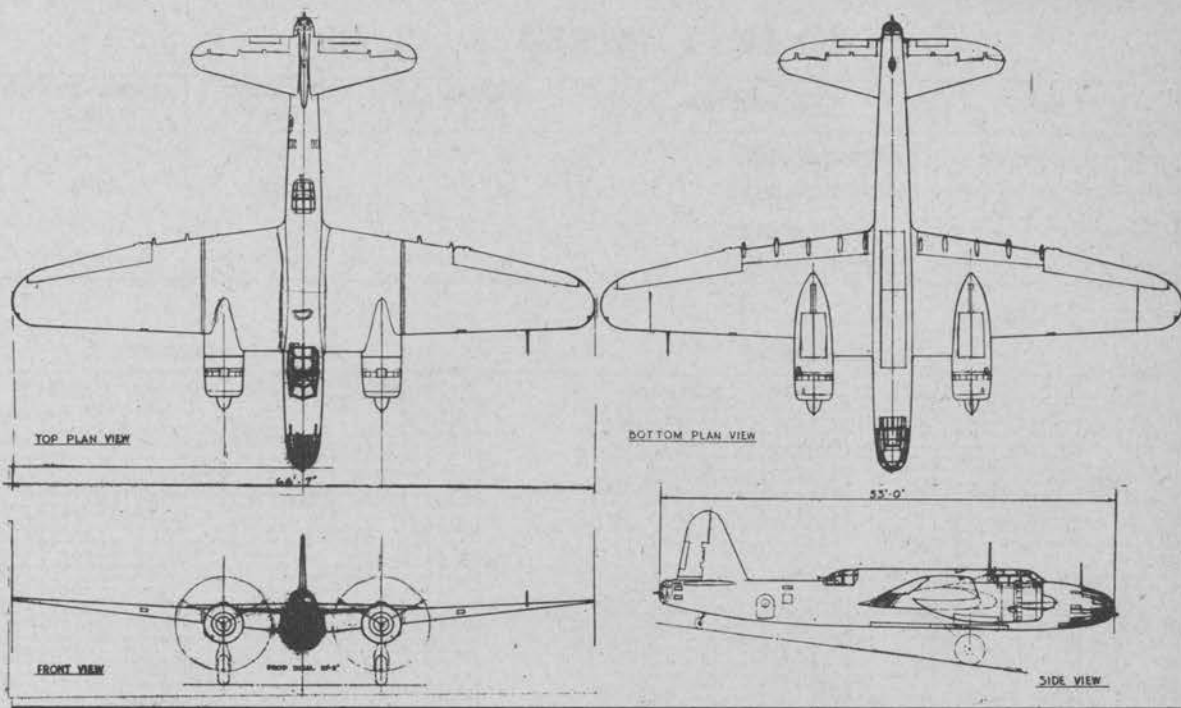
	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward	1	12.7mm		Flex.	Tail	1	12.7 mm		Flex.
Top	1	20 mm		Flex.	Wing				
Side	2	7.9 mm		Flex.					
Bottom	1	7.9 mm		Flex.					

## TACTICAL DATA

Bullet proof glass and armor plate for the pilot plus armor for the tail gunner and the dorsal turret gunner offer ample protection in HELEN. Fuel tanks are leak-proofed with thin laminated rubber and kapok.

DATE December 1944

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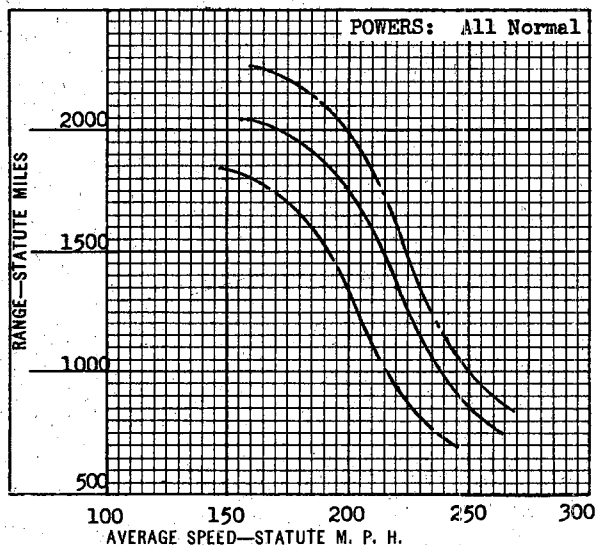
RESTRICTED

DATE December 1944

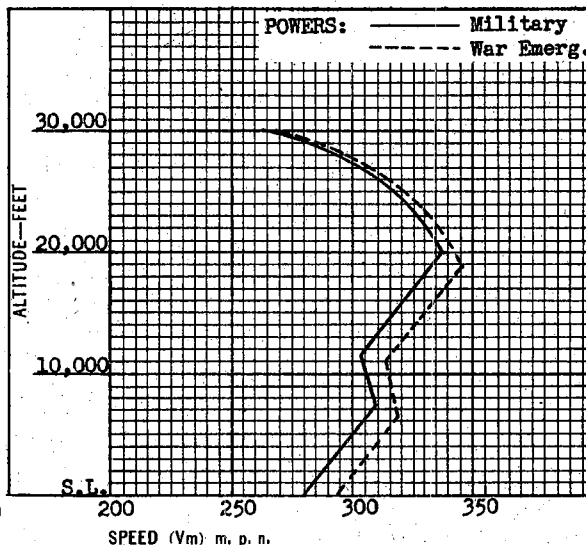
## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	NORMAL BOMBER	30,900	6150	1775
-----	NORMAL BOMBER	30,900	6150	1775
————	TORPEDO BOMBER	31,000	6150	1875
-----	SUICIDE BOMBER	30,715	6786	3550

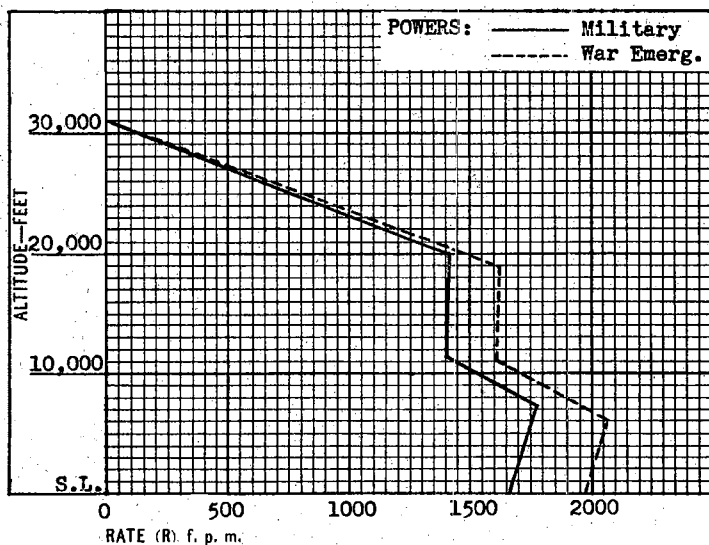
RANGE VS. SPEED



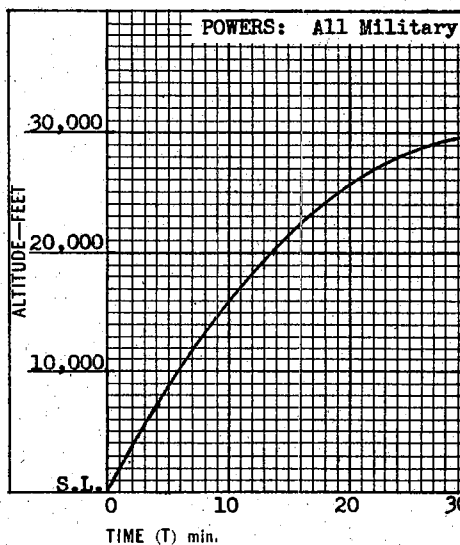
SPEED VS. ALTITUDE



RATE OF CLIMB



TIME TO ALTITUDE



## PERFORMANCE AND CHARACTERISTICS

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	30,900	2700
T. O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 30,900 lbs.	lbs.	Feet	Min.
Rate @ S. L.		1665	1
Rate @ 20,000 ft.		1410	1
Time to 10,000'			5.9
Time to 20,000'			13.0
Service ceiling 30,100			

### AIRCRAFT

Duty Bomber
Designation K1 67
Description Mid-wing monoplane
Mfg. Mitsubishi
Engines 2 Crew 7
Construction All metal; semi-monocoque fuselage; cantilever wing.

### SPEED

@ 30,900 lbs.	Mph.	Knts.	Altitude
Maximum	294	255	@ S. L.
Maximum	346	300	@ 18,700'
Cruising - Combat	265	230	@ 1500'
Economical - Cruising	156	135	@ 1500'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	1	800 kg	1775
Torpedo	1	800 kg	1875
Maximum Suicide	2	800 kg	3550

### ENGINES

	H. P.	Altitude
Take-off	1890	S. L.
Normal	1345	1500'
Military	1775	7200'
	1640	20,000'
War Emerg.	1985	6000'
	1810	18,700'

### WEIGHTS

	Lbs.
Empty	
Gross Bomber	30,900
Torpedo Bomber	31,000
Suicide Bomber	30,715
Overload	

### FUEL

	U. S. gal.	Imp. gal.
Built-in	1025	851
Internal (Removable) (For suicide version only)	106	88
External (drop)		
Maximum	1025	851
" Suicide	1131	940

Mfg. Mitsubishi
Model Ha 42 Model 11 (Ha 104)
Type Radial
Cylinders 18 Cooling Air Fan Assisted
Supercharger 2 Speed
Propeller 4 Blade Diam. 11.8'
Electric VDM
Fuel—Take-off 92 Cruising 92

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	2040	1775	156	135	1500	1025	851	1775	
Range @ Combat Cr	750	650	264	229	1500	1025	851	1775	
Maximum range Torpedo	1840	1600	147	128	1500	1025	851	1875	
Range @ Combat Cr Radius ( )	695	603	249	216	1500	1025	851	1875	
Suicide Max. Range Radius ( )	2260	1960	159	138	1500	1131	940	3550	

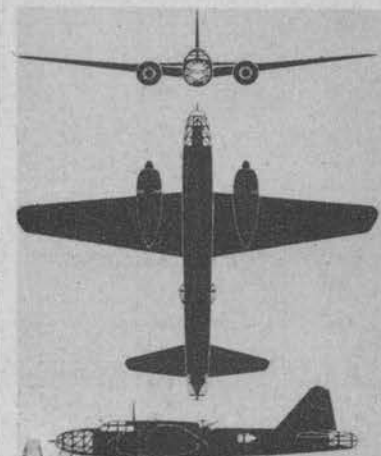
### DIMENSIONS

Span 73.8'	Length 61.4'
Height 18.4'	Wing area 709 sq. ft.

### GENERAL DATA

All fuel tanks are portected with 3-ply rubber, 5/8" thick. Pilot and co-pilot are protected by back and head armor.

This is an army bomber which may be converted for torpedo bombing or for suicide missions. For further information on this plane refer to TAIC Summary No. 26.



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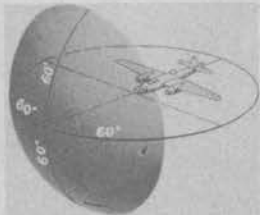
DATE May 1945



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# PEGGY 1

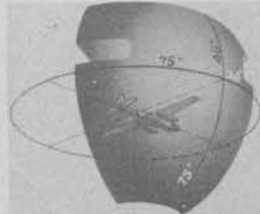
## FIELDS OF FIRE



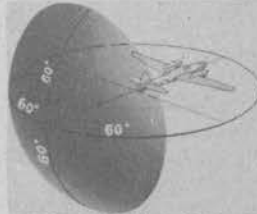
FORWARD GUN "A" 1x12.7mm.  
3/4-front view from above



TOP GUN "B" 1x20mm.  
3/4-rear view from above  
Powered Turret



SIDE GUN "C" 1x12.7mm.  
3/4-rear view from below  
Post a Bar mount  
Side Gun "D" similar



TAIL GUN "E" 1x12.7mm.  
3/4-rear view from above

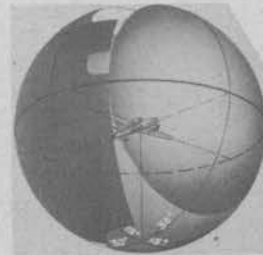
### NOTE

Above Fields of Fire  
are estimated.

## FIRE FREE FIELDS



3/4-front view from above



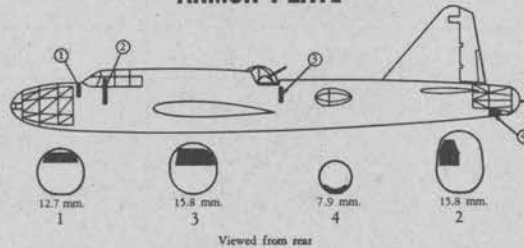
3/4-front view from below

## EXHAUST FLAME PATTERNS



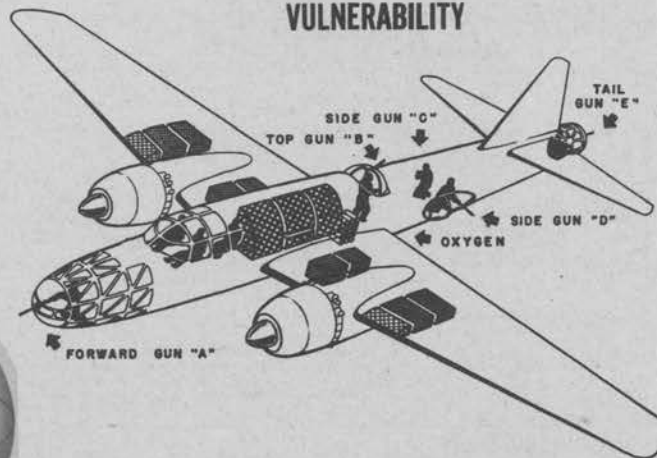
REAR VIEW

## ARMOR PLATE



Viewed from rear

## VULNERABILITY



### LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	1	12.7mm	550	Type 1, Flexible Mtd. (Browning)
Top	1	20 mm	500	HO 5 (Browning) in power turret
Side	2	12.7mm	500	Type 1, Flexible Mtd. (Browning)
Tail	1	12.7mm	700	Type 1, Flexible Mtd. (Browning)

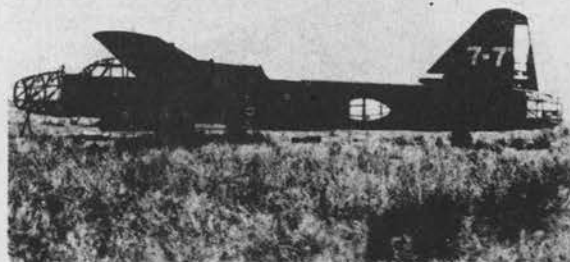
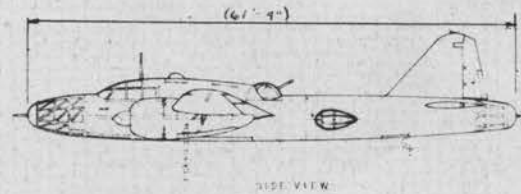
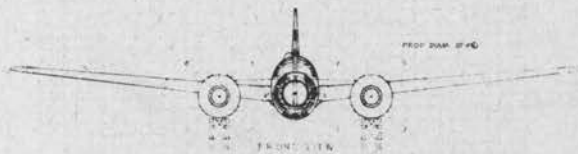
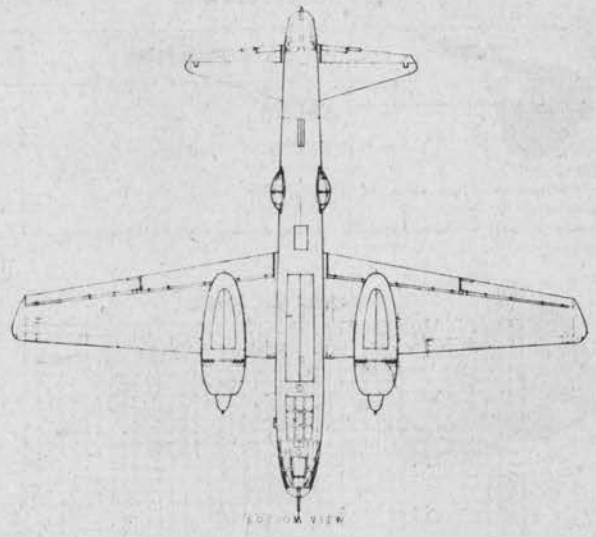
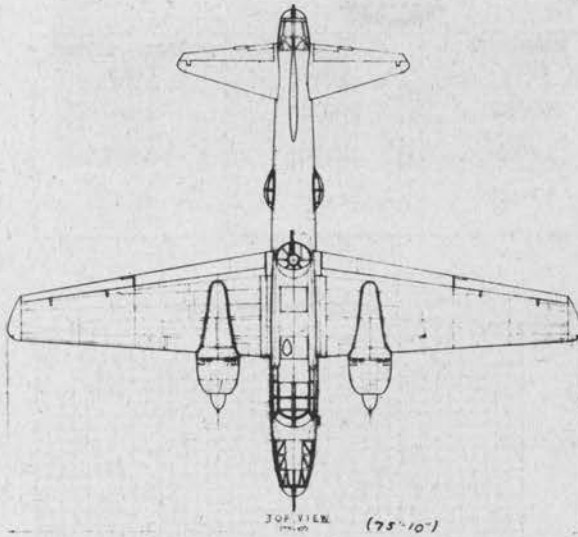
## TACTICAL DATA

PEGGY may be radar equipped. POW report states that one version of this aircraft was equipped with canon slightly smaller than the 75 mm field piece.

DATE May 1945

RESTRICTED

UNCLASSIFIED 554A-4  
**PEGGY 1**



**RESTRICTED**

DATE June 1945

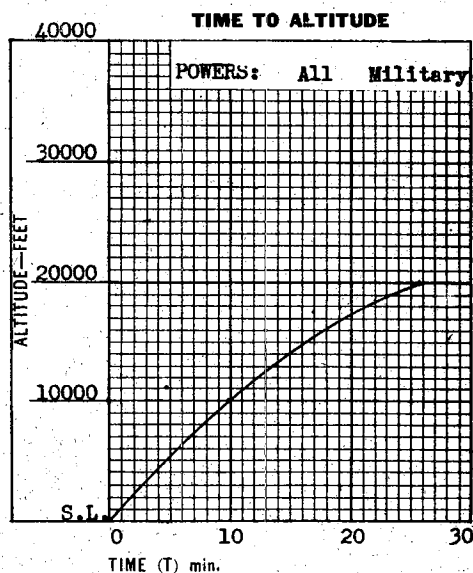
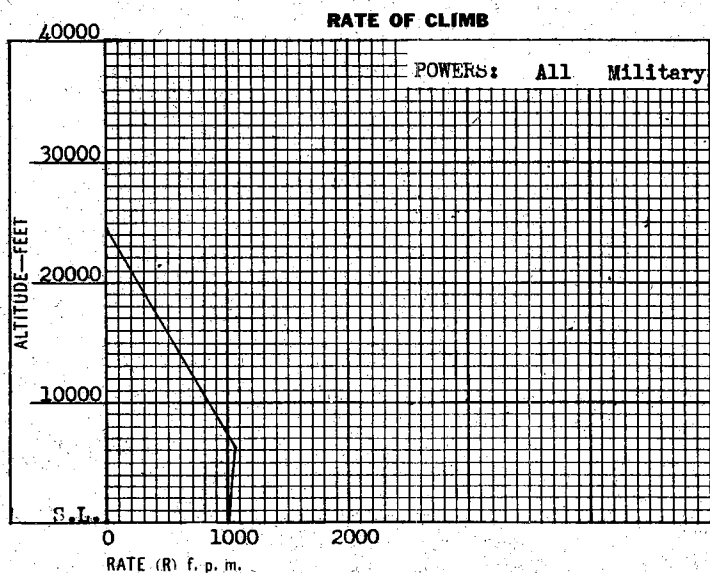
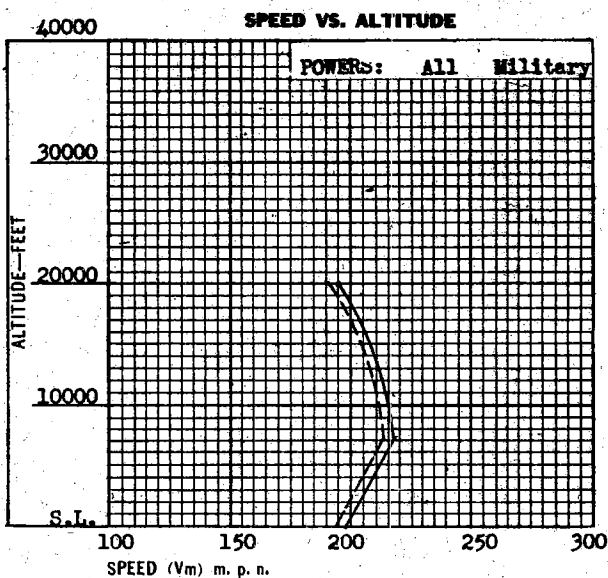
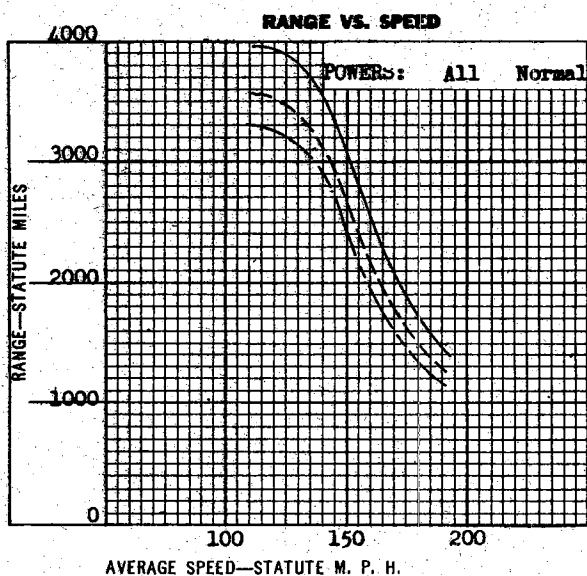
UNCLASSIFIED



# MAVIS 22

## RANGE \* SPEED \* CLIMB

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	PATROL	50700	20000	None
-----	BOMBER	50700	18600	1586
-----	TORPEDO	50700	16460	3530



DATE December 1944

UNCLASSIFIED 601A-2

# PERFORMANCE AND CHARACTERISTICS

## MAVIS 22

### TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB-CEILING

@ 50,700 lbs.	Feet	Min.
Rate @ S.L.	1004	1
Rate @ 6,200 ft.	1063	1
Time to 10,000'		9.9
Time to 20,000'		25.8
Service ceiling 24,680'		

### AIRCRAFT

Duty	Patrol Transport
Designation	Type 97, Model 11
Description	High Parasol Wing Flying Boat
Mfg.	Kawanishi
Engines	4
Crew	8-10
Construction	Metal

### SPEED

@ 50700 lbs.	Mph.	Knts.	Altitude
Maximum	198	171	@ S. L.
Maximum	217	188	@ 6,200'
Cruising 75%	145	126	1,500'
Economical			

### BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	2	800 kg	3520
or	12	60 kg	1584
Maximum	2	800 kg (Torps)	3520

### ENGINES

	H. P.	Altitude
Take-off	1030	S.L.
Normal	840 910	S.L. 8,200'
Military	990	S.L.
War Emerg.	1050	6,200'

### WEIGHTS

	Lbs.
Empty	25,600
Gross	50,700
Overload	

### FUEL

	U.S. gal.	Imp. gal.
Built-in	3330	2764
Internal (Removable)		
External (drop)		
Maximum	3330	2764

Mfg.	Mitsubishi
Model	Kinsei 43
Type	Radial
Cylinders	14
Cooling	Air
Supercharger	Single speed
Propeller	3 Blade Diam. 10.5'
Fuel - Take-off	92
Cruising	92

### RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	3980	3460	112	97	1500	3330	2764	None	None
At 75% Vmax.	3350	2909	145	126	1500	3330	2764	None	None
Maximum range (normal fuel)	3300	2866	109	94	1500	2745	2764	3520	None
At 75% Vmax.	2740	2375	144	124	1500	2745	2764	3520	None
Radius ( )									
Radius ( )									

### DIMENSIONS

Span	131.3'	Length	82'
Height	20.5'	Wing area	1830 sq.ft.

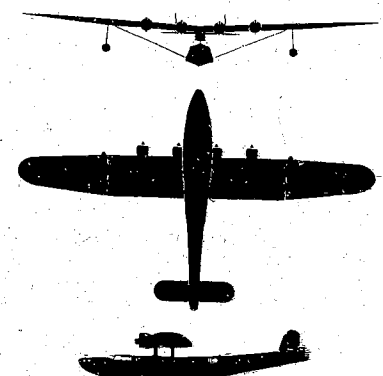
### GENERAL DATA

MAVIS is rapidly becoming obsolete as an operational military aircraft. Figures shown for "Maximum Range (Normal Fuel)" are given as an example of the range and load carrying ability - cargo could easily be substituted for bomb figures.

MAVIS has now largely been replaced by EMILY except for rear area transport purposes.

Radar has been indicated on the few MAVIS 22's seen in the combat areas.

DATE December 1944



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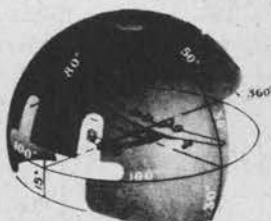
# UNCLASSIFIED

## MAVIS 22

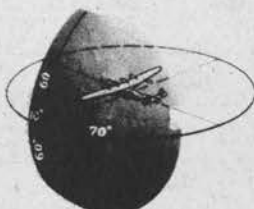
### FIELDS OF FIRE



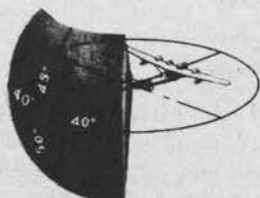
NOSE GUN "A" 1x7.7mm  
or 1x20 mm  
3/4-front view from above



DORSAL GUN "B" 1x7.7mm  
or 1x20 mm.  
3/4-rear view from above



SIDE GUN "C" 1x20mm.  
3/4-rear view from above  
Side Gun "D" similar

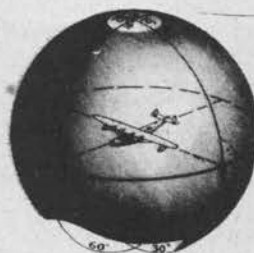


TAIL GUN "E" 1x20mm.  
3/4-rear view from above

#### NOTE:

A ventral gun, probably 1x7.7mm, has been reported but not verified.

### FIRE FREE FIELDS



3/4-front view from above

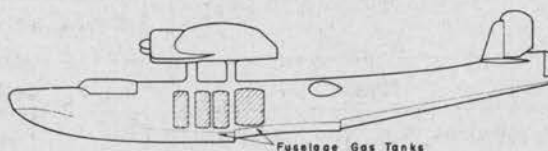


3/4-front view from below

### EXHAUST FLAME PATTERNS

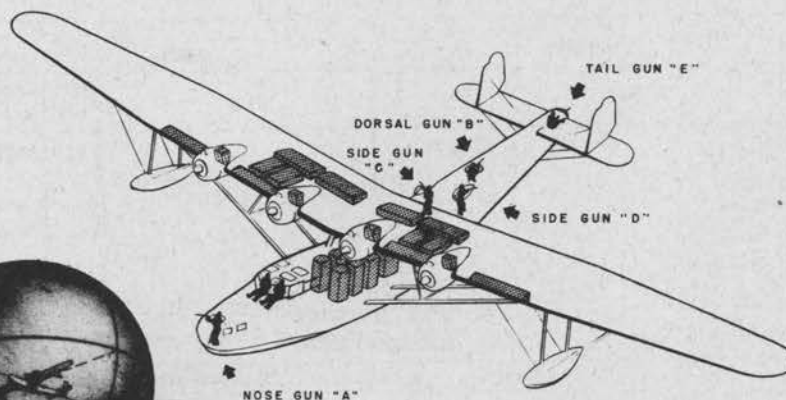


### ARMOR PLATE



None recovered or reported.

### VULNERABILITY



#### LEGEND

Fuel tanks unprotected

Oil tanks protected

Fuel tanks protected

Fuel tanks unprotected

### ARMAMENT

	No.	Size	Rds. Gun	Type
Nose	1	7.7mm	6x97	Type 97 Flexible, Lewis type.
Dorsal	1	7.7mm	6x97	Type 97 Flexible, Lewis type.
Sides	2	7.7mm	6x97	Type 97 Flexible, Lewis type.
Tail	1	20mm	6x45	Type 99 Mk 1 Flexible, Oerlikon type.

### TACTICAL DATA

All present 7.7 mm guns may be replaced by 20 mm.

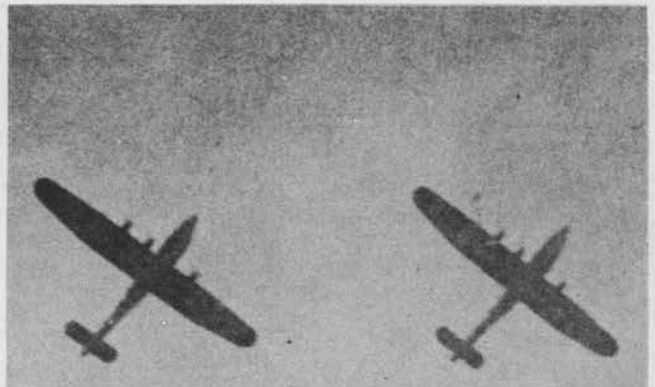
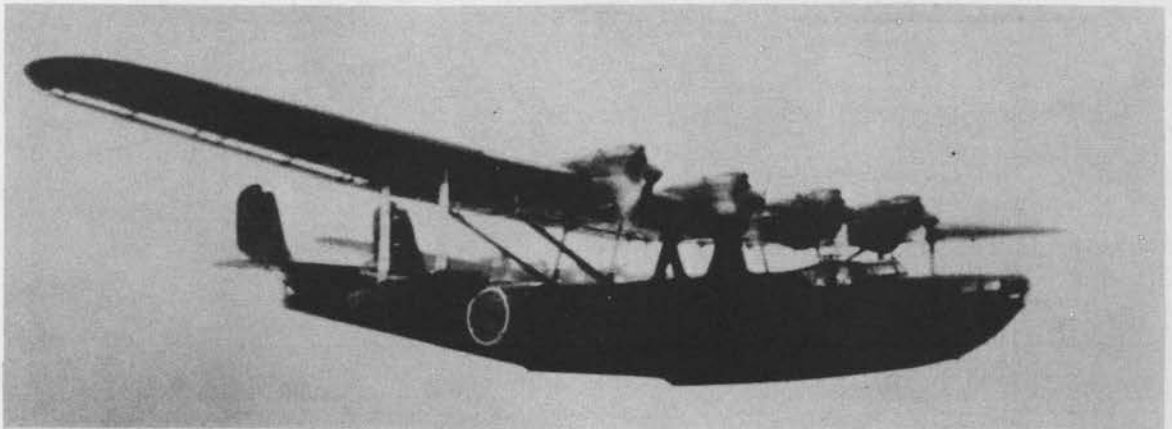
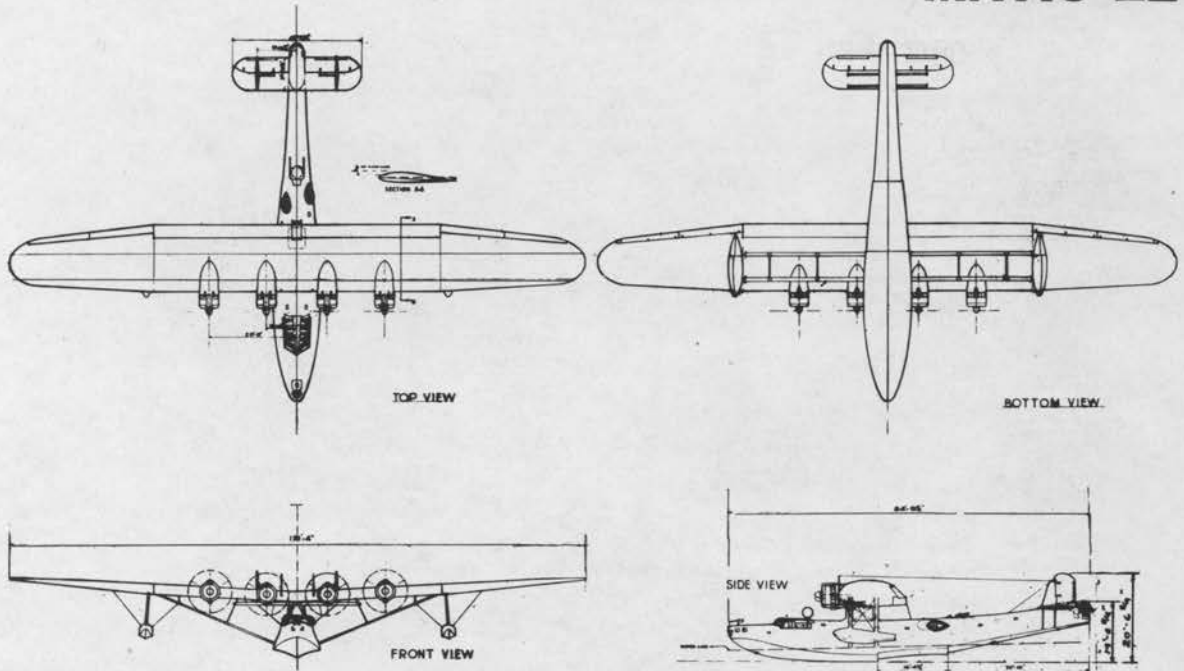
DATE June 1945

RESTRICTED

# UNCLASSIFIED

# UNCLASSIFIED 601A-4

## MAVIS 22



**RESTRICTED**

**DATE** December 1944

# UNCLASSIFIED

**CHERRY 11****UNCLASSIFIED**

Vulnerability, Fields of Fire, etc.

**ARMAMENT**

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward					Tail				
Top					Wing				
Side									
Bottom									

**TACTICAL DATA**

No information.

DATE December 1944

**UNCLASSIFIED**

# UNCLASSIFIED

602A-2

## PERFORMANCE AND CHARACTERISTICS

## CHERRY 11

### TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB-CEILING

@	lbs.	Feet	Min.
Rate @ S.L.			
Rate @	ft.		
Time to			
Time to			
Service ceiling			

### AIRCRAFT

Duty Flying Boat
Designation Type 99, Model 11
Description High-wing Monoplane
Mfg. Kawanishi
Engines 2 Crew
Construction

### SPEED

@	lbs.	Mph.	Knts.	Altitude
Maximum				@ S. L.
Maximum				@
Cruising				
Economical				

### BOMBS-CARGO

	No.	Size	Total Lbs.
Normal			
Maximum			

### ENGINES

	H. P.	Altitude
Take-off		
Normal		
Military		
War Emerg.		

### WEIGHTS

	Lbs.
Empty	
Gross	
Overload	

### FUEL

	U.S. gal.	Imp. gal.
Built-in		
Internal (Removable)		
External (drop)		
Maximum		

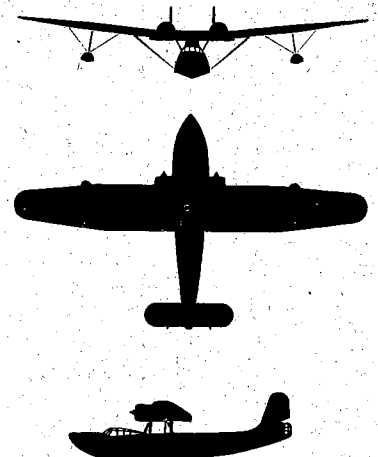
Mfg.	
Model	
Type	
Cylinders	Cooling
Supercharger	
Propeller	Diam.
Fuel - Take-off	Cruising

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

### DIMENSIONS

Span 103.5'	Length 67.6'
Height	Wing area sq.ft.



### GENERAL DATA

No performance figures are available on CHERRY, but because of its similarity to MAVIS, it may possibly be manufactured by Kawanishi and its performance comparable with a two engine version of MAVIS 11. Few encounters have been made with this patrol boat.

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DATE June 1945

# UNCLASSIFIED

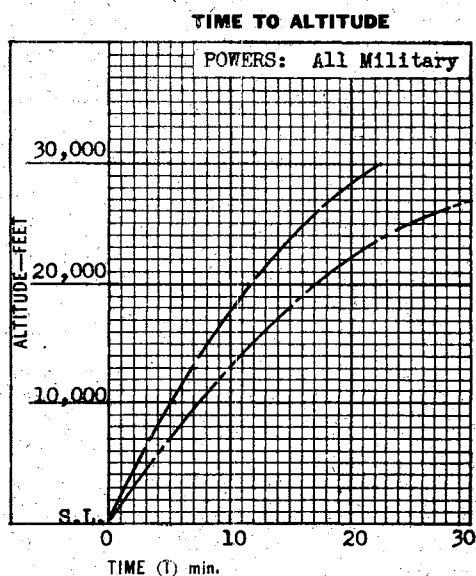
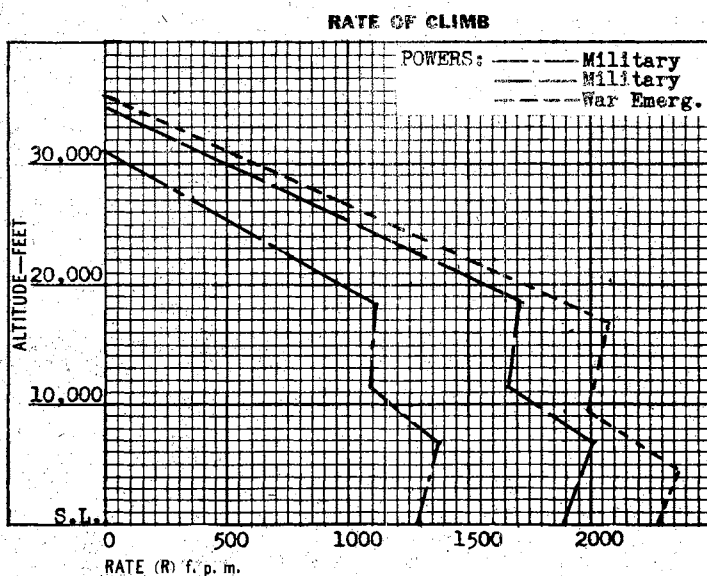
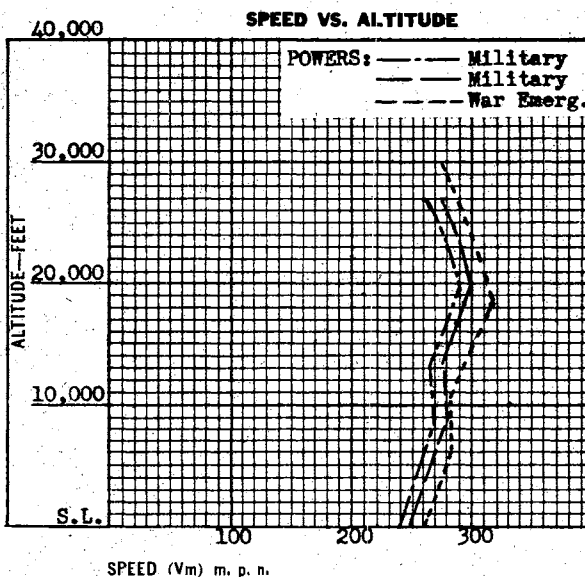
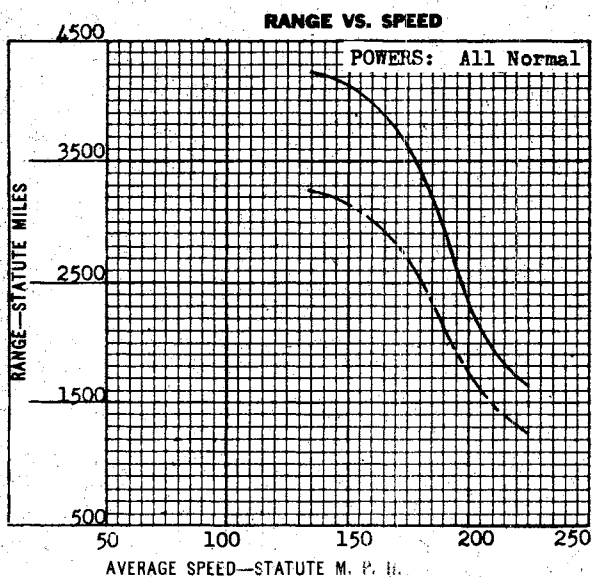


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EMILY 12

**RANGE \* SPEED \* CLIMB**

KEY	CONDITION	WEIGHT (lb.)	FUEL LOAD (lb.)	BOMBS—CARGO (lb.)
————	TORPEDO OVERLOAD	71,649	22,950	3530
————	PATROL OVERLOAD	71,649	29,950	None
————	NORMAL PATROL	54,529	12,220	None
-----	NORMAL PATROL	54,529	12,220	None



UNCLASSIFIED

DATE May 1946

## PERFORMANCE AND CHARACTERISTICS

## EMILY 12

### TAKE-OFF

	Load	Feet
T. O. calm		
T. O. 25 kt. wind		
T. O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 54,529 lbs.	Feet	Min.
Rate @ S. L.	2290	1
Rate @ 16,800 ft.	2080	1
Time to 10,000'		5.2
Time to 20,000'		11.1
Service ceiling 34,500'		

### AIRCRAFT

Duty Patrol Bomber
Designation Type 2 Model 12
Description High-wing Flying Boat
Mfg. Kawanishi
Engines 4 Crew 9
Construction All metal: semi-monocoque fuselage; cantilever wing.

### SPEED

@ 54,529 lbs.	Mph.	Knts.	Altitude
Maximum	262.4		@ S. L.
Maximum @ 71,649 lbs	305.7		@ 16,800'
Cruising - Combat	226		@ 1500'
Economical - Cruising	137		@ 1500'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal	2 x 1765 lb.	Torpedoes	3530
Maximum			

### ENGINES

	H. P.	Altitude
Take-off	1825	S.L.
Normal	1530	1500'
Military	1655	6900'
	1520	18,200'
War Emerg.	1880	4400'
	1735	16,800'

### WEIGHTS

	Lbs.
Empty	37,765
Gross	54,529
Overload	71,649

### FUEL

	U. S. gal.	Imp. gal.
Built-in	4740	3948
Internal (Removable)		
External (drop)		
Maximum	4740	3948

Mfg. Mitsubishi
Model Kasei 22
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 4 Bl C.S. Diam. 12.79'
Fuel—Take-off 92 Cruising 92 plus ADI

### RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	4190	3640	137	119	1500	4740	3948	None	None
Range @ Combat Cr	1635	1420	226	196	1500	4740	3948	None	None
Maximum range (normal fuel)	3230	2805	135	117	1500	3634	3029	3530	None
Range @ Combat Cr	1246	1082	225	195	1500	3634	3029	3530	None
Radius ( )									
Radius ( )									

### DIMENSIONS

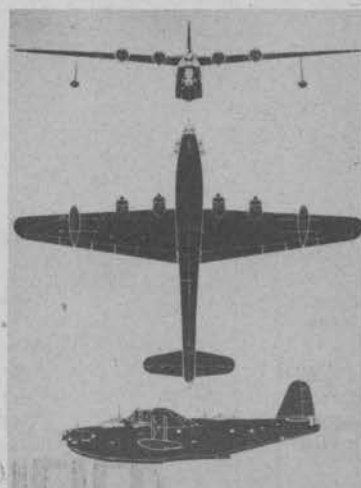
Span 124.67'	Length 92.3'
Height 30.2'	Wing area 1722 sq. ft.

### GENERAL DATA

EMILY 12 is one of the outstanding patrol bombers of the war. It has long range, remarkable speed, well protected fuel system and is the most heavily armored of any Jap aircraft.

Range is calculated allowing for dropping the bombs at mid-distance of range. All bombs and torpedoes are carried externally.

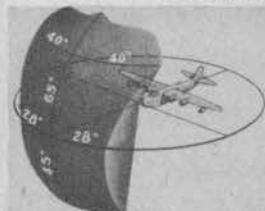
This plane was formerly coded EMILY 22.



UNCLASSIFIED

## EMILY 12

## FIELDS OF FIRE



FORWARD GUN "A" 1 x 20 mm.  
3/4-front view from above  
Power operated



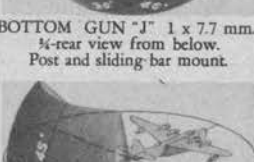
SIDE GUN "E" 1 x 20 mm.  
Approx. side view from below.  
Post mount.  
Field of fire for SIDE GUN "F" similar



AUX. WING GUN "G" 1 x 7.7 mm. Post mount.  
3/4-front view from below.  
Field of fire for SIDE GUN "H" similar



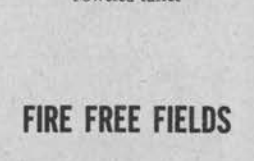
AUX. PORT COCKPIT GUN "B" 1 x 7.7 mm. Post mount.  
3/4-front view from above



BOTTOM GUN "J" 1 x 7.7 mm.  
3/4-rear view from below.  
Post and sliding bar mount.



TAIL GUN "K" 1 x 20 mm.  
3/4-rear view from below.  
Powered turret



TOP GUN "I" 1 x 20 mm.  
3/4-rear view from below.  
Powered turret

## FIRE FREE FIELDS

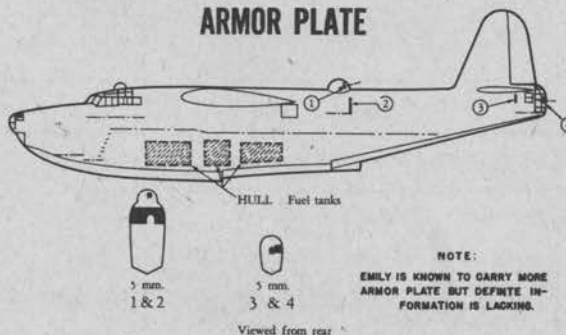
ON THE ASSUMPTION THAT ALL GUNS CAN BE MANNED SIMULTANEOUSLY, THERE ARE NO APPRECIABLE FIRE FREE FIELDS.

## EXHAUST FLAME PATTERNS



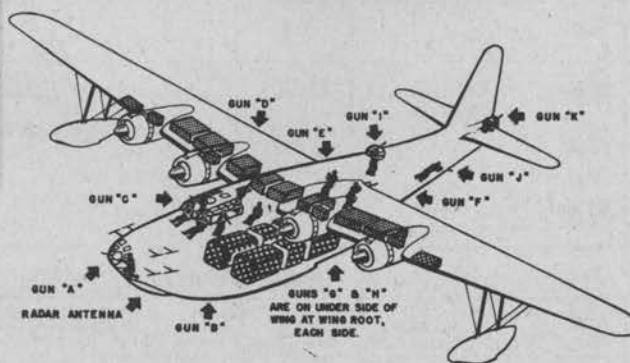
REAR VIEW

## ARMOR PLATE



NOTE:  
EMILY IS KNOWN TO CARRY MORE ARMOR PLATE BUT DEFINITE INFORMATION IS LACKING.

## VULNERABILITY



NOTE:  
WING TANKS ON LATE MODELS ARE PROBABLY PROTECTED.

## LEGEND

Fuel tanks, unprotected

Fuel tanks, protected

Oil tanks, unprotected

Oil tanks, protected

## ARMAMENT

	No.	Size	Rds. Gun	Type		No.	Size	Rds. Gun	Type
Forward Nose	1	20 mm		Power Operated	Tail	1	20 mm	495	
Top	1	20 mm	225	Powered	Wing				
Top Aux	1	7.7 mm		Flex.					
Side	2	20 mm		Flex.	Aux. Cockpit	2	7.7 mm		Flex.
Aux.	2	7.7 mm		Flex.					
Bottom	1	7.7 mm	340	Flex.					

## TACTICAL DATA

EMILY, equipped with radar, is used principally as a long range search plane. Installation of leak proof fuel tanks reputedly bullet proof increased weight 1980 lbs. Improved fire fighting equipment installed. When used as a transport EMILY carries one 7.7 mm

DATE May 1945

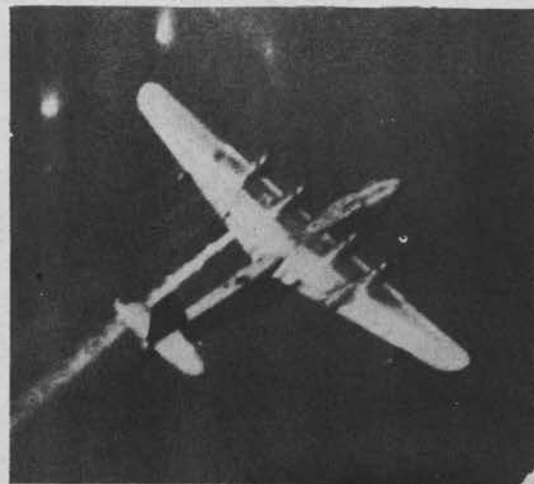
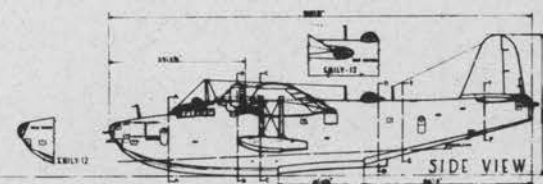
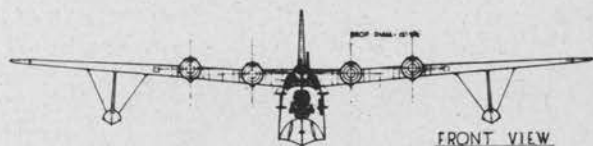
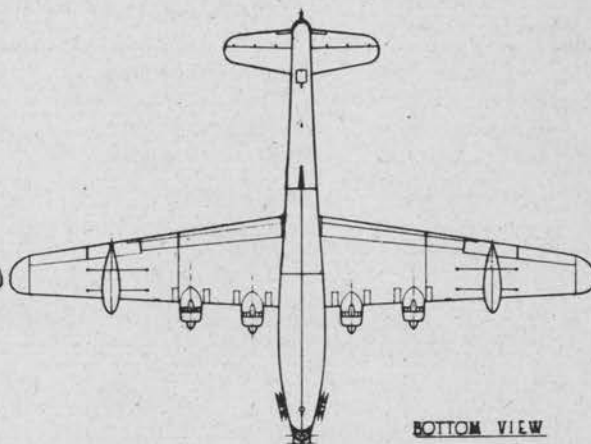
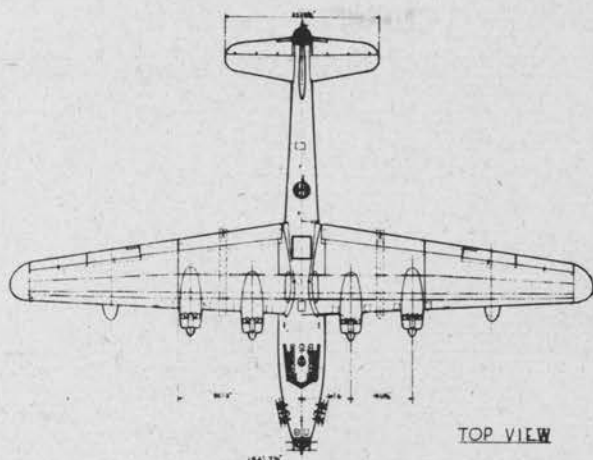
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603A-4

## EMILY 12



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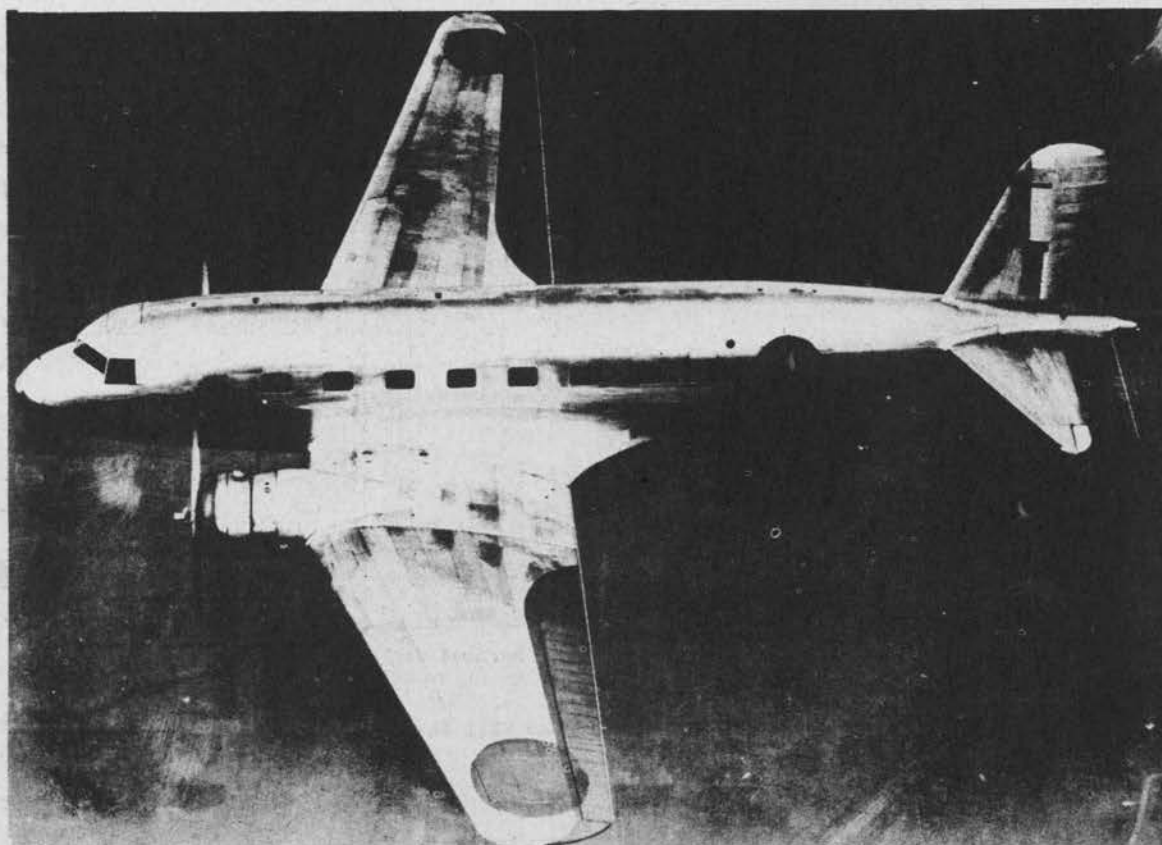
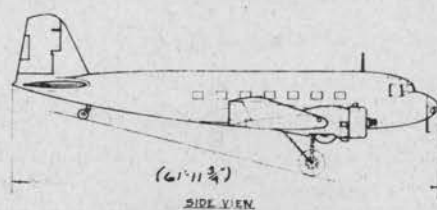
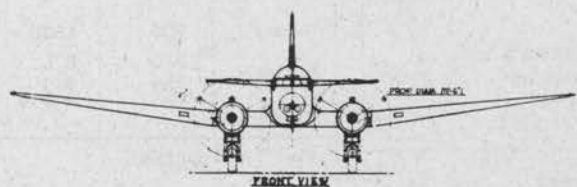
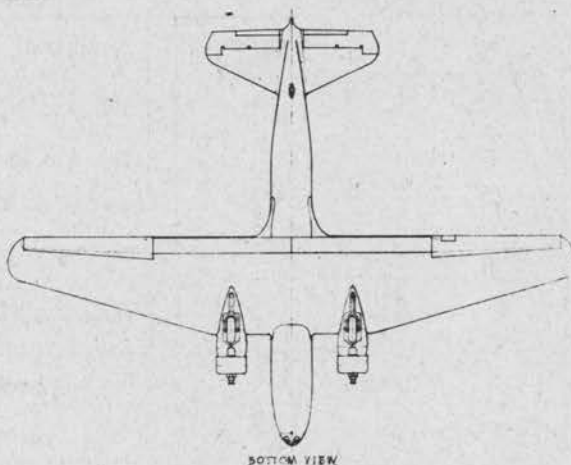
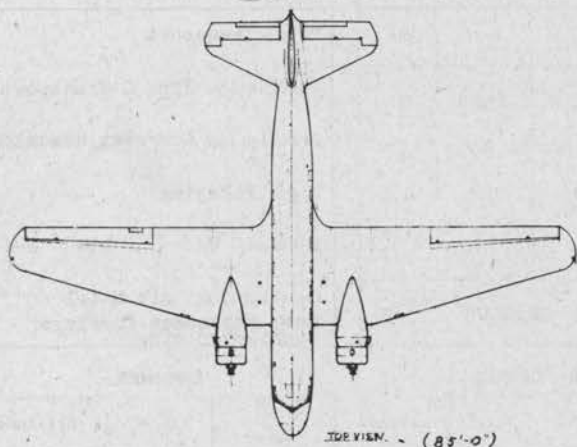
DATE May 1945

# UNCLASSIFIED



701A-1

TESS 11 UNCLASSIFIED



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DATE June 1945

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## PERFORMANCE AND CHARACTERISTICS

### TAKE-OFF

	Load	Feet
T.O. calm		
T.O. 25 kt. wind		
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 18,500 lbs.	lbs.	Feet	Min.
Rate @ S.L.		1525	1
Rate @ 6,400 ft.		1650	1
Time to 6,400'			4.0
Time to			
Service ceiling 28,500'			

### AIRCRAFT

Duty Transport
Designation Type O Transport
Description Low-wing Monoplane
Mfg. Nakajima
Engines 2 Crew 3-4
Construction All Metal Semi monocoque fuselage, Cantilever wing

### SPEED

@18,500 lbs.	Mph.	Knts.	Altitude
Maximum	220	191	@ S. L.
Maximum	240	208	@ 8,000'
Cruising	210	182	@ 8,000'
Economical	110	95.5	@ 8,000'

### BOMBS—CARGO

	No.	Size	Total Lbs.
Normal			
Maximum	Passengers with baggage or freight		3,000

### ENGINES

	H. P.	Altitude
Take-off	1045	S.L.
Normal	780	1500
Military	920	S.L.
War Emerg.	980	640

### WEIGHTS

	Lbs.
Empty	12,300
Gross	18,500
Overload	

### FUEL

	U.S. gal.	Imp. gal.
Built-in Wings	510	425
Internal Fuselage	210	175
External (drop)		
Maximum	720	600

Mfg. Mitsubishi  
Model Kinsei 43  
Type Radial  
Cylinders 14 Cooling Air  
Supercharger Single Speed  
Propeller 3 Bl. CS Diam. 10.5'  
Fuel - Take-off 92 Cruising 92

### RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1785	1569	110	95.5	8,000	720	600		
	1350	1131	210	182	8,000	720	600		
Maximum range (normal fuel)	1245	1081	110	95.5	8,000	510	425		
	940	816	210	182	8,000	510	425		
Radius ( )									
Radius ( )									

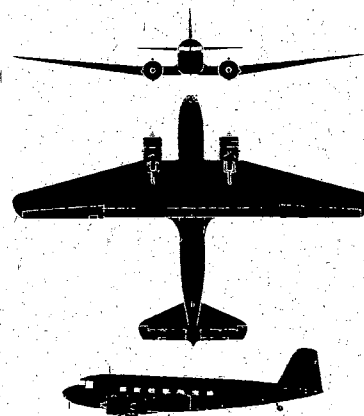
### DIMENSIONS

Span 85'	Length 62'
Height 20.3'	Wing area 939 sq.ft.

### GENERAL DATA

TESS 11 is similar to the Douglas DC2. It may be used for transporting a maximum of 16-18 parachute troops.

Further performance data is being tabulated and will be issued shortly.



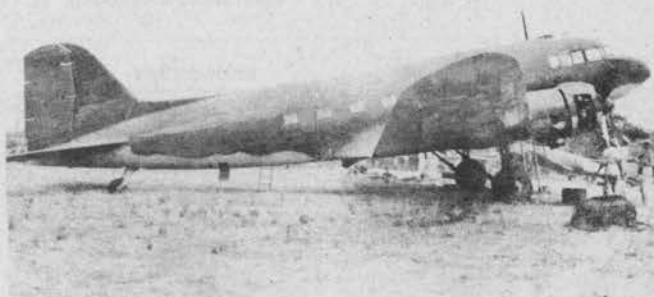
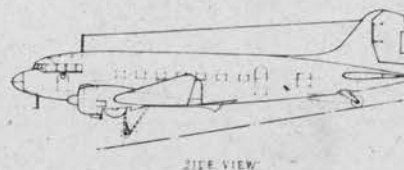
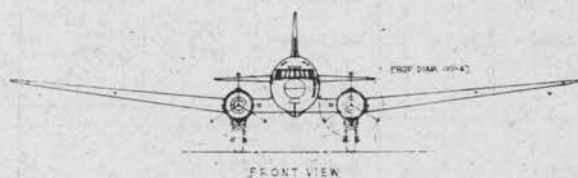
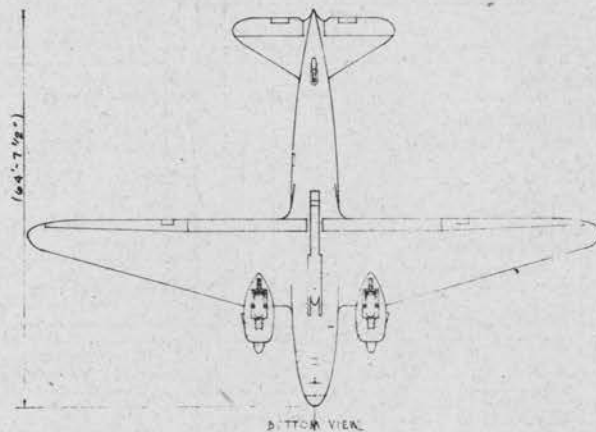
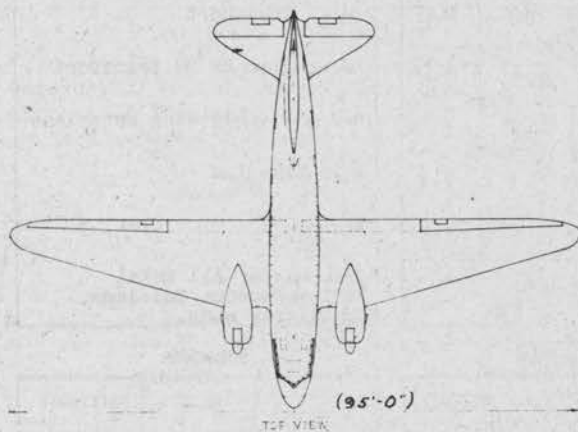
DATE June 1945



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TABBY 22

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DATE June 1945

## PERFORMANCE AND CHARACTERISTICS

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	24,020	1900
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB-CEILING

@ 24,020 lbs.	Feet	Min.
Rate @ S.L.	1055	1
Rate @ 2400 ft.	1130	1
Time to 10,000'		9.4
Time to 20,000'		29.7
Service ceiling 24,450		

### AIRCRAFT

Duty Transport
Designation Mk D2 Transport
Description Low-wing Monoplane
Mfg. Nakajima
Engines 2      Crew 3
Construction All metal Semi-monocoque fuselage, cantilever wing.

### SPEED

@24020 lbs.	Mph.	Knts.	Altitude
Maximum	219	190	@ S. L.
Maximum	200	174	@ 6400'
Cruising	192	167	1500'
Continuous			
Economical	113	98	1500'
Cruising			

### BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	12 Passengers @ 143# ea. plus individual hand baggage @ 33# plus Freight 500#		2615

### ENGINES

	H. P.	Altitude
Take-off	1045	S.L.
Normal	780	1500
Military	920	S.L.
War Emerg.	980	6400

### WEIGHTS

	Lbs.
Empty	16370
Gross	24020
Overload	

### FUEL

	U.S. gal.	Imp. gal.
Built-in	822	684
Internal (Removable)		
External (drop)		
Maximum	822	684

Mfg. Mitsubishi
Model Kinsei 43
Type Radial
Cylinders 14      Cooling Air
Supercharger Single Speed
Propeller 3 bd. CS Diam. 10'6"
Fuel - Take-off 92 Cruising 92

### RANGE AND RADII

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)									
Maximum range (normal fuel)	2080	1805	113	98	1500	822	684		
Range @ Cont Cr. Radius ( )	755	655	192	167	1500	822	684		
Radius ( )									

### DIMENSIONS

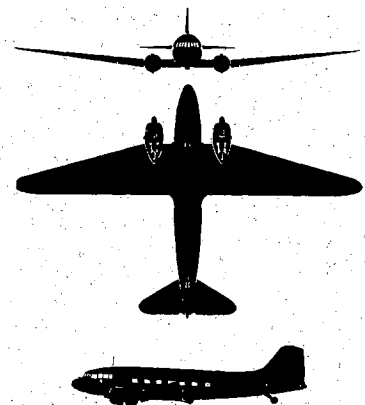
Span 95'	Length 64.7'
Height 23.3'	Wing area 987 sq.ft.

### GENERAL DATA

TABBY is similar to the original Douglas design of the DC-3.

The fuel arrangement may be modified, however, to carry two extra tanks on each side in the outboard panels of the wing which would increase the range considerably.

Kinsei 53 engines may also power TABBY. They develop 1075 h.p. at take-off.



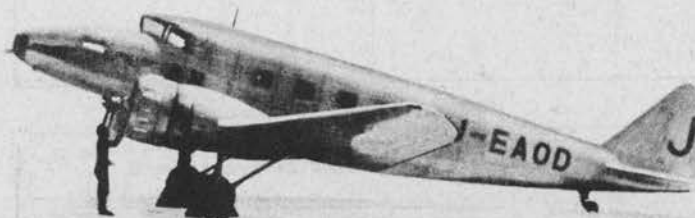
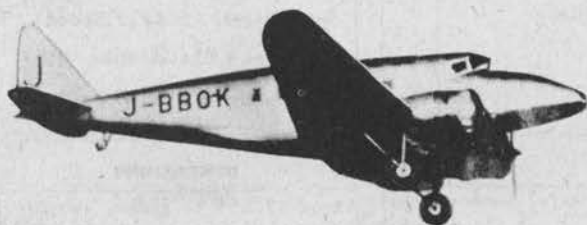
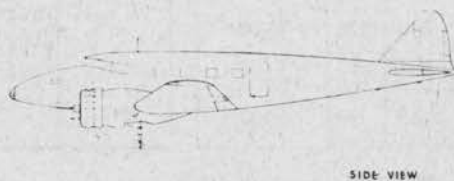
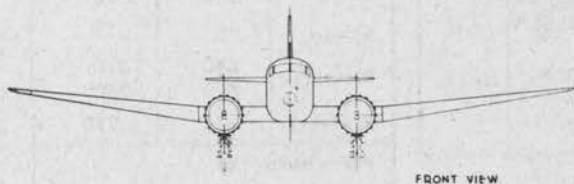
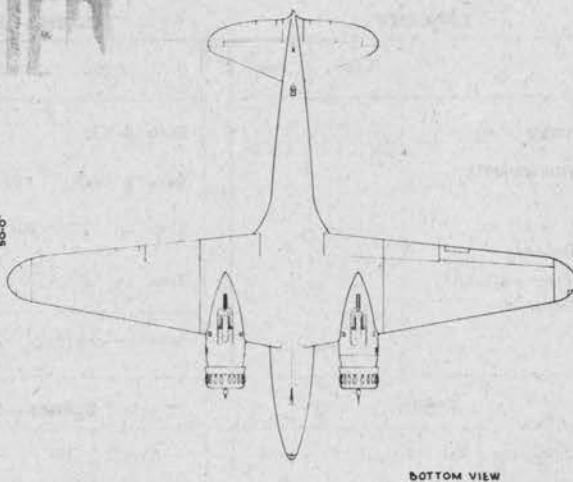
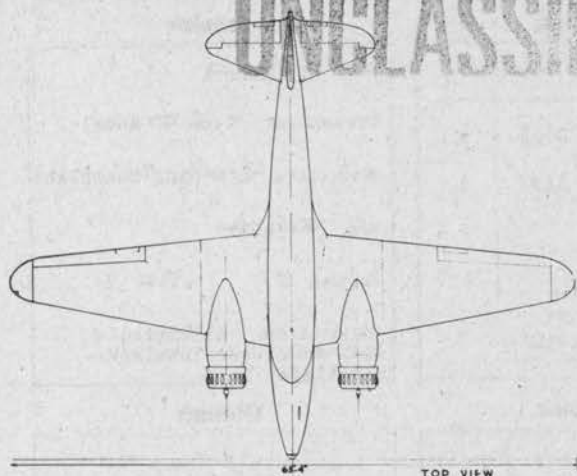
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# THORA 1

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# PERFORMANCE AND CHARACTERISTICS

UNCLASSIFIED 751A2  
THORA 1

## TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	10,736	1056
T.O. over 50' obstacle		
Landing over 50' obstacle		

## CLIMB-CEILING

@ 10,736 lbs.	Feet	Min.
Rate @ S.L.	1146	1
Rate @ 7500 ft.	1296	1
Time to		
Time to		
Service ceiling	20,800	

## AIRCRAFT

Duty Transport
Designation Type 97 Model 2
Description Low-wing Monoplane
Mfg. Nakajima
Engines 2 Crew 2
Construction All metal - semi-monocoque fuselage - cantilever wing

## SPEED

@ 10736 lbs.	Mph.	Knts.	Altitude
Maximum	207	180	@ S. L.
Maximum	231	200	@ 7500'
Cruising Continuous	213	185	1500'
Economical Cruising	119	103	1500'

## BOMBS-CARGO

	No.	Size	Total Lbs.
Normal	8 passengers	@ 154 lbs.	1232
Maximum			

## ENGINES

	H. P.	Altitude
Take-off	590	S.L.
Normal		
Military	450	S.L.
War Emerg.	500	7500
	625	4750

## WEIGHTS

	Lbs.
Empty	7,656
Gross	10,736
Overload	

## FUEL

	U.S. gal.	Imp. gal.
Built-in	237	197
Internal (Removable)		
External (drop)		
Maximum	237	197

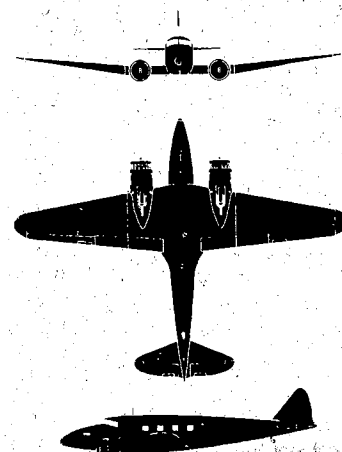
Mfg. Nakajima
Model Type 97 550 hp
Type Radial
Cylinders 9 Cooling Air
Supercharger Single Speed
Propeller 3 blade Diam. 9.0'
Fuel - Take-off 85 Cruising 85

## RANGE AND RADIUS

	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1170	1016	119	103	1500	237	197	None	1232
Range @ Cont. Cr.	384	333	213	185	1500	237	197	None	1232
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

## DIMENSIONS

Span 65.4'	Length 50.0'
Height 13.16'	Wing area 573 sq. ft.



## GENERAL DATA

This transport may possibly be used to transport 8 parachute troops.

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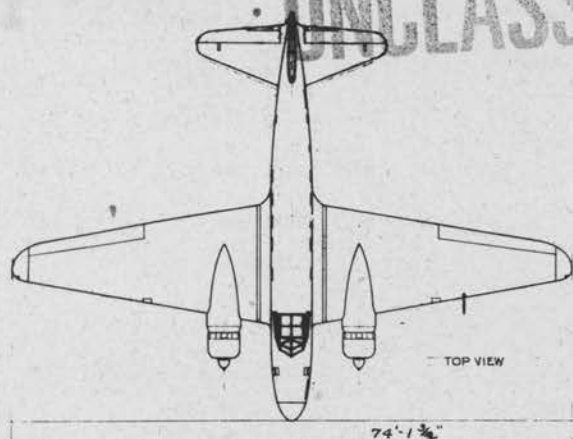
DATE June 1945

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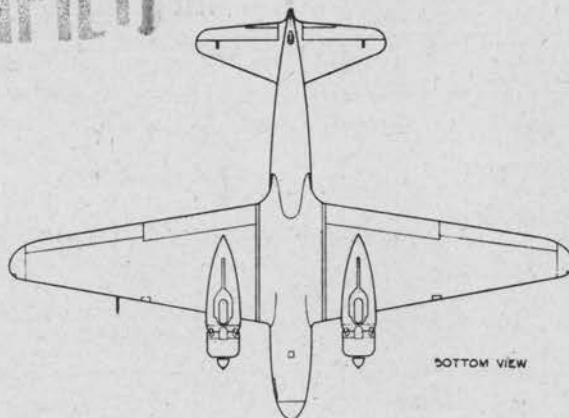
753A-1

# TOPSY 1

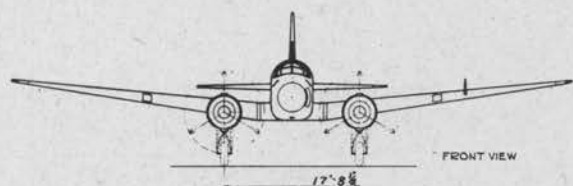
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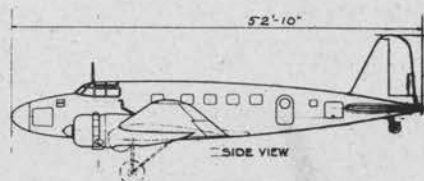
TOP VIEW



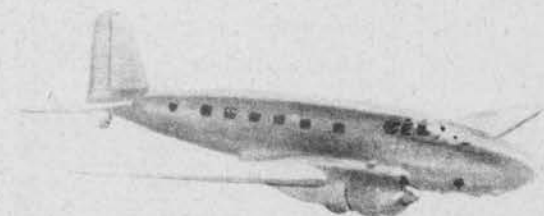
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



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## PERFORMANCE AND CHARACTERISTICS

## TOPSY 1

### TAKE-OFF

	Load	Feet
<b>Runway Requirements</b>	18,300	1430
T.O. over 50' obstacle		
Landing over 50' obstacle		

### CLIMB—CEILING

@ 18,300	lbs.	Feet	Min.
Rate @ S.L.		1648	1
Rate @ 19,000 ft.		1432	1
Time to 10,000'			5.93
Time to 20,000'			12.86
Service ceiling 31,600'			

### AIRCRAFT

Duty Transport
Designation Type MC 20
Description Low-wing Monoplane
Mfg. Mitsubishi
Engines 2 Crew 4
Construction All metal - Semi-monocoque fuselage Cantilever wing

### SPEED

@18,300 lbs.	Mph.	Knts.	Altitude
Maximum	233	202	@ S. L.
Maximum	278	241	@ 19,000
Cruising Continuous	221	192	1,500'
Economical Cruising	129	112	1,500'

### BOMBS—CARGO

	No.	Size	Total lbs.
Normal	11	Passengers @ 154 lbs.	1694
Maximum			

### ENGINES

	H. P.	Altitude
Take-off	1065	S.L.
Normal	785	1500'
Military	1040	9200'
	935	19000'
War Emerg.	1135	8500'
	1020	18500'

### WEIGHTS

	Lbs.
Empty	11,905
Gross	18,300
Overload	19,750

### FUEL

	U.S. gal.	Imp. gal.
Built-in	680	566
Internal (Removable)		
External (drop)		
Maximum	680	566

Mfg. Mitsubishi
Model Type 1 1050 h.p.
Type Radial
Cylinders 14 Cooling Air
Supercharger 2 Speed
Propeller 3 blade Diam. 10.8' C.S.
Fuel - Take-off 92 Cruising 92

### RANGE AND RANGE

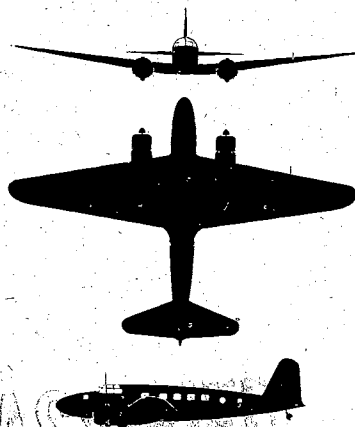
	Miles		Speed		Alt. feet	Fuel gal.		Bombs lbs.	Cargo lbs.
	stat.	naut.	mph.	Knts.		U. S.	Imp.		
Maximum range (maximum fuel)	1909	1657	129	112	1500	680	566		1694
Range @ Cont. Cr.	680	591	221	192	1500	680	566		1694
Maximum range (normal fuel)									
Radius ( )									
Radius ( )									

### DIMENSIONS

Span 74'	Length 52.8'
Height 16.2'	Wing area 755 sq.ft.

### GENERAL DATA

TOPSY has also been used by Army parachute troops. A maximum of 16 men, including crew, may be carried.



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NOTES

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850

# ENGINES

## GENERAL

This section includes the principal characteristics and performance of engines of the following status:

- A. Operational (major operational in forward areas).
- B. Obsolescent (minor operational in forward areas).
- C. The principal engines known or believed to be close to production or in production and expected to appear in the near future.

## DEFINITIONS AND NOMENCLATURE

(1) Model - This is the operational designation which is assigned, usually, when the engine is accepted by the J.A.F. and has reached production status.

(2) Other designations - The designation given as a "Ha" number followed by a "Model" number is the jointly adopted Army-Navy abbreviated designation which is intended by the Japanese for use in communications, sketches, etc.

(3) The Ha number in parenthesis ( ) is the original experimental designation. In the cases where an abbreviated designation is assigned it will probably supersede the latter for purposes of Japanese communications.

It will be noted that certain engines (as an example, see Type 99 950 hp and Sakae Model 12) are given the same abbreviated designation but their operational designations differ. These engines actually differ slightly both in structure and performance. Another example of assignment of the same abbreviated designation to structurally slightly different engines is the Homare - Ha 45 series. It is apparent, therefore, that the abbreviated designation alone does not in all cases fully identify an engine, whereas the operational designation does fully identify it. In communications to TAIC, the operational designations, if known, should always be used, followed by the abbreviated designation if any ambiguity might result by the omission of the latter. In such cases where the operational designation is not known, the abbreviated designation must, of course, be used.

Relative importance of the various designations where all the designations are known is in the descending order discussed in (1), (2) and (3) above.

## PERFORMANCE

All ratings tabulated are taken from documents unless followed by asterisk (\*). The latter are TAIC estimates.

Take-off - This is usually a one minute rating.

W.E.P. - (War Emergency Power) - These ratings are in most cases estimated extrapolations based on take-off boost pressure. For most engines, documents indicate that take-off boost is permissible for one minute for either take-off or emergency. If one minute is permissible for take-off it is quite probable that under certain flight conditions, this period could be exceeded. Its exact duration is conjectural, but until better information is available, should, to be conservative from a tactical point of view, be considered as at least a five minute rating.

Military - Power available for 30 minutes.

## CHARACTERISTICS

BBL - Barrel Carb. - Carburetor  
UD - Up draft Inj. - Injection  
DD - Down draft Imp. - Impeller  
A.D.I. - Anti-detonant injection.

Dry wt. - This is without starter and accessories.  
\* - A single asterisk, throughout the data sheets indicates an estimate.

HIRO - 11th Air Arsenal

(?) - Questions all data preceeding it. Thus "Myrt 12(?)" the entire aircraft is questionable.

? - Question mark without parenthesis questions only the data with which it is immediately associated. Thus Myrt 12? indicates Myrt is known but the 12 is questionable.

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# ENGINES

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## DESIGNATION

Model	TYPE 99 950 HP	SAKAE MODEL 11	SAKAE MODEL 12
Manufacturer	Nakajima & Kawasaki	Nakajima & Ishikawajima	Nakajima & Ishikawajima
Other designations	Ha 35 Model 12, (Ha 25)	Ha 35 Model 11, (NK1B)	Ha 35 Model 12, (NK1C)

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	975/2700/38.8"/SL	985/2550/39.8"/SL	925/2550/39.8"/SL
W.E.P.	975/2700/38.8"/SL	985/2550/39.8"/SL	925/2550/39.8"/SL
W.E.P.	1040/2700/38.8"/10000*	1030/2550/39.8"/7500*	1010/2550/39.8"/11000*
W.E.P.			
Military	860/2600/35.0"/SL	870/2550/35.8"/SL	820/2500/35.8"/SL
Military	955/2600/35.0"/11100'	955/2500/35.8"/9850'	935/2500/35.8"/13800'
Military			

## FUEL

Cruise and normal	87	92	92
T.O./Mil./W.E.P.	87	92	92

## CHARACTERISTICS

Fuel metering system	2 BBL. U.D. Float Carb.	2 BBL. U.D. Float Carb.	2 BBL. U.D. Float Carb.
Compression ratio	6.7	6.7	6.7
Propeller ratio	.6875	.6875	.6875
Supercharger	Single Speed	Single Speed	Single Speed
Ratio (s)	7.125	7.125	7.53
Imp. diam. - mm. in.	280 11"	280 11"	290 11.4"
Diameter - mm. in.	1150 45.3"	1150 45.3"	1150 45.3"
Bore/Stroke - mm. in.	130/150 5.12"/5.91"	130/150 5.12"/5.91"	130/150 5.12"/5.91"
Displace. - ltr. cu.in.	27.9 1700	27.9 1700	27.9 1700
Dry wt. - kg. lbs.	530 1165	530 1165	530 1165

## INSTALLED IN

Cnde name	OSCAR 1 LILY 1	KATE 12	ZEKE 11 & 21 RUFÉ 11
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## REMARKS

	UNCLASSIFIED		
	See page 874.		See page 875.

# UNCLASSIFIED 852

## ENGINES

### DESIGNATION

Model	SAKAE MODEL 21	SAKAE MODEL 22	TYPE 2 1150 HP
Manufacturer	Nakajima & Ishikawajima	Nakajima	Nakajima & Kawasaki
Other designations	Ha 35 Model 21, (NK1F)	Ha 35 Model 22, (NK1G)	Ha 35 Model 23, (Ha 115)

### TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

### PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1115/2750/41.7"/SL	1115/2750/41.7"/SL	1105/2800/41.7"/SL
W.E.P.	1115/2750/41.7"/SL	1115/2750/41.7"/SL	1105/2800/41.7"/SL
W.E.P.	1180/2750/41.7"/7500'*	1180/2750/41.7"/7500'*	1165/2800/41.7"/8000'*
W.E.P.	1040/2750/41.7"/18000'*	1040/2750/41.7"/18000'*	1030/2800/41.7"/18900'*
Military	995/2700/37.8"/SL	995/2700/37.8"/SL	995/2700/37.8"/SL*
Military	1085/2700/37.8"/9350'	1085/2700/37.8"/9350'	1085/2700/37.8"/9200'
Military	965/2700/37.8"/19700'	965/2700/37.8"/19700'	965/2700/37.8"/19700'

### FUEL

Cruise and normal	92	92	92
T.O./Mil./W.E.P.	92	92	92

### CHARACTERISTICS

Fuel metering system	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.
Compression ratio	7.0	7.0	7.0
Propeller ratio	.583	.5853	.6875
Supercharger	2 Speed	2 Speed	2 Speed
Ratio (s)	6.37 & 8.44	6.37 & 8.44	6.37 & 8.44
Imp. diam. - mm. in.	305 12.0"	305 12.0"	305 12.0"
Diameter - mm. in.	1150 45.3"	1150 45.3"	1150 45.3"
Bore/Stroke - mm. in.	130/150 5.12"/5.91"	130/150 5.12"/5.91"	130/150 5.12"/5.91"
Displace. - ltr. cu.in.	27.9 1700	27.9 1700	27.9 1700
Dry wt. - kg. lbs.	590 1300	590 1300	600 1320

### INSTALLED IN

Code name	ZEKE 22, 32, & 52 RUF 12 (?) IRVING 11	IRVING 11 (Exp) (1 Sakae 21, 1 Sakae 22)	LILY 2 OSCAR 2
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### REMARKS

		Same as Sakae Model 21 except for direction of propeller rotation.	
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DATE December 1944

See page 876.

# **ENGINES**

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## **DESIGNATION**

Model		SAKAE Model 31	SAKAE Model 31 A
Manufacturer		Nakajima	Nakajima
Other designations	Ha 35 Model 24, (Ha 115 SU)	Ha 35 Model 31,	Ha 35 Model 31

## **TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## **PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off		1120/2800/41.7"/SL *	1120/2800/41.7"/SL **
W.E.P.		1120/2800/41.7"/SL *	1120/2800/41.7"/SL *
W.E.P.		1210/2800/41.7"/8000' *	1210/2800/41.7"/8000' *
W.E.P.		1055/2800/41.7"/20400' *	1055/2800/41.7"/20400' *
Military		995/2700/37.8"/SL *	995/2700/37.8"/SL *
Military		1085/2700/37.8"/9300' *	1085/2700/37.8"/9300' *
Military		950/2700/37.8"/21700' *	950/2700/37.8"/21700' *

## **FUEL**

Cruise and normal T.O./Mil./ W.E.P.		92 92 & ADI	92 92
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## **CHARACTERISTICS**

Fuel metering system	2 BBL. D.D. Low Pressure Inject	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.
Compression ratio		7.0*	7.0
Propeller ratio		.583	.583
Supercharger		2 Speed	2 Speed
Ratio (s)		6.37 & 9.00	6.37 & 9.00
Imp. diam. - mm.   in.		305   12"	305   12"
Diameter - mm.   in.		1150   45.3"	1150   45.3"
Bore/Stroke - mm.   in.		130/150   5.12"/5.91"	130/150   5.12"/5.91"
Displace. - ltr.   cu.in.		27.9   1700	27.9   1700
Dry wt. - kg.   lbs.		590   1300 lbs.	590   1300 lbs.

## **INSTALLED IN**

Code name	OSCAR 2	ZEKE 52 (?)	ZEKE 52
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## **REMARKS**

	Injectors located around diffuser casing. Floatless carb. of similar principle as Stromberg injection carb.	Valve timing same as Homare 11. High supercharger gear ratio increased over Model 21. Has 10 min. W.E.P. rating.	Same as Model 31 but without ADI. ** Performance duration limited as for Model 21. ( 1 min. for T.O. and W.E.P.)
		See page 877.	See page 877.

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## DESIGNATION

Model	SAKAE Model 31 B	TYPE 99 900 HP Model 2	ZUISEI Model 13
Manufacturer	Nakajima	Mitsubishi	Mitsubishi
Other designations	Ha 35 Model 31	Ha 31 Model 15, (Ha 26 Mod. 2)	Ha 31 Model 13

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1120/2800/41.7"/SL *	930/2600/38.0"/SL	840/2600/37.0"/SL *
W.E.P.	1120/2800/41.7"/SL *	930/2600/38.0"/SL	840/2600/37.0"/SL *
W.E.P.	1210/2800/41.7"/8000' *	990/2600/38.0"/7500' *	910/2600/37.0"/11400' *
W.E.P.	1080/2800/41.7"/18900' *		
Military	995/2700/37.8"/SL *	850/2500/36.0"/SL	770/2540/34.7"/SL
Military	1085/2700/37.8"/9350' *	910/2500/36.0"/8000'	865/2540/34.7"/13100'
Military	965/2700/37.8"/19700' *		

## FUEL

Cruise and normal	92	87	87
T.O./Mil./W.E.P.	92	87	87

## CHARACTERISTICS

Fuel metering system	2 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.
Compression ratio	7.0		6.5
Propeller ratio	.583	.625	.727
Supercharger	2 Speed	Single Speed	Single Speed
Ratio (s)	6.37 & 8.44	8.48	8.48
Imp. diam. - mm. in.	305 12"	230 9.05"	260 10.25"
Diameter - mm. in.	1150 45.3"	1118 44.05"	1118 44.05"
Bore/Stroke - mm. in.	130/150 5.12"/5.91"	140/130 5.51"/5.12"	140/130 5.51"/5.12"
Displace. - ltr. cu.in.	27.9 1700	28.0 1710	28.0 1710
Dry wt. - kg. lbs.	590 1300 lbs.	526 1162	546 1200

## INSTALLED IN

Code name	ZEKE 52 (?)	SONIA 1 DINAH 1 THELMA 1 (Tr.)	PETE 11 JAKE 11
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## REMARKS

	Same as Model 31 A but with high supercharger gear ratio same as SAKAE 21.		
	See page 877.	See page 878.	

DATE December 1944



# ENGINES

UNCLASSIFIED

## DESIGNATION

Model Manufacturer	TYPE 1 1050 HP Mitsubishi	KINSEI Models 41 thru 44 Mitsubishi **	KINSEI Models 45 & 46 Mitsubishi
Other designations	Ha 31 Model 21, (Ha 102)		

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1065/2700/40.5"/SL	1045/2550/38.0"/SL	985/2550/38.0"/SL
W.E.P.	1065/2700/40.5"/SL		
W.E.P.	1135/2700/40.5"/8500' *		
W.E.P.	1020/2700/40.5"/18500' *		
Military	975/2600/37.0"/SL	990/2500/35.8"/SL	920/2500/35.8"/SL
Military	1040/2600/37.0"/9200'	1065/2500/35.8"/6600'	1055/2500/35.8"/13800'
Military	935/2600/37.0"/19000'		

## FUEL

Cruise and normal	92	87	92
T.O./Mil./W.E.P.	92	92	92

## CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Float Carb.	3 BBL. D.D. Float Carb.	3 BBL. D.D. Float Carb.
Compression ratio	7.0	6.6	6.6
Propeller ratio	.625	.700	.700
Supercharger	2 Speed	Single Speed	Single Speed
Ratio (s)	7.0 & 9.118	8.485	8.485
Imp. diam. - mm. in.	280 11.02"	245 9.65"	280 11.0"
Diameter - mm. in.	1118 44.05"	1218 48.0"	1218 48.0"
Bore/Stroke-mm. in.	140/130 5.51"/5.12"	140/150 5.51"/5.91"	140/150 5.51"/5.91"
Displace. - ltr. cu.in.	28.02 1710	32.34 1970	32.34 1970
Dry wt. - kg. lbs.	565 1250	560 1240	560 1240

## INSTALLED IN

Code name	DINAH 2 NICK 1	TESS 11 (43) JAKE 11 (43,44)	MAVIS 22 (46)
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## REMARKS

		Models same except for accessories.  ** 44 also mfd. by Hiro.	Models same except for accessories.
	See page 879.	See page 880.	See page 880.

DATE December 1944

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**UNCLASSIFIED**  
**ENGINES**

#### DESIGNATION

Model	KINSEI Models 51 thru 54		KINSEI Model 62
Manufacturer	Mitsubishi	Mitsubishi	Mitsubishi
Other designation	Ha 33 Mod 51 thru 54 (**)	Ha33 Mod62(Ha112 Mod.2)	Ha33 Mod62 (MK8P)

#### TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

#### PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1280/2600/42.9"/SL	1580/2600/49.6"/SL	( )
W.E.P.	1280/2600/42.9"/SL	1580/2600/49.6"/SL	( Estimated )
W.E.P.	1355/2600/42.9"/7700' *	1620/2600/49.6"/2900' *	( same )
W.E.P.	1240/2600/42.9"/18500' *	1490/2600/49.6"/16700' *	( as )
Military	1075/2500/37.8"/SL	1200/2500/41.7"/SL	( Ha 112 Model 2 )
Military	1185/2500/37.8"/9850'	1280/2500/41.7"/6550'	( )
Military	1085/2500/37.8"/20300'	1185/2500/41.7"/19700'	( )

#### FUEL

Cruise and normal	92) or (87	92	92
T.O./Mil./Combat	92) (87 & ADI	92 & ADI	92 & ADI

#### CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Float Carb.	Direct Injection Pump	Direct Injection Pump
Compression ratio	7.0	7.0	
Propeller ratio	.633	.633	.636 †
Supercharger	2 speed	2 speed	2 speed
Ratio (s)	7.0 & 9.118	7.0 & 9.118	7.0 & 9.118
Imp. diam. -mm. in.	290 11.4"	320 12.6"	
Diameter -mm. in.	1218 48.0"	1218 48.0"	
Bore/Stroke -mm. in.	140/150 5.51/5.91"	140/150 5.51"/5.91"	140/150 5.51"/5.91"
Displace - ltr. cu.in.	32.34 1970	32.34 1970	32.34 1970
Dry wt. - kg. lbs.	609 1340	609 1340	

#### INSTALLED IN

Code name	VAL 22 (51 & 54) NELL 23 (51, 52 & 53) NELL 23 Tr (52) TABBY 22 Tr (51, 52 & 53)	DINAH 3	JUDY 33
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#### REMARKS

	TABBY 32 Tr. (?) (53) MAVIS 23 (51 & 53) EDNA 1 (51) PAUL 11 (54) Engines same except for Accessories **(MK8A, MK8(B?), MK8(C?), MK8(D?), respectively)  See Page 881.	See Page 881.	
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DATE March 1945

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# **ENGINES**

UNCLASSIFIED

## **DESIGNATION**

Model	ATSUTA Model 21	ATSUTA Model 31	TYPE 2 1100 HP
Manufacturer	Aichi	Aichi	Kawasaki
Other designation	Ha 60 Model 21, (AEIA)	Ha 60 Model 31, (AEIP)	Ha 60 Model 22, (Ha 40)

## **TYPE**

Cylinder arrangement	Inverted V	Inverted V	Inverted V
Coolant	Liquid	Liquid	Liquid
Number of cylinders	12	12	12

## **PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off	1185/2500/42.7"/SL	1380/2800/42.7"/SL	1160/2500/42.9"/SL
W.E.P.	1185/2500/42.7"/SL	1380/2800/42.7"/SL	1160/2500/42.9"/SL
W.E.P.	1205/2500/42.7"/1400' *	1440/2800/42.7"/5700' *	
W.E.P.	1140/2500/42.7"/12300' *	1320/2800/42.7"/17700' *	1100/2500/42.9"/12600'
Military	935/2400/35.8"/SL	1265/2600/39.8"/SL	1030/2400/39.0"/SL
Military	995/2400/35.8"/4930'	1320/2600/39.8"/5550'	
Military	955/2400/35.8"/14800'	1265/2600/39.8"/16400'	1085/2400/39.0"/13800'

## **FUEL**

Cruise and normal	91	92	92
T.O./Mil./Combat	91	92	92

## **CHARACTERISTICS**

Fuel metering system	Direct Injection Pump		Direct Injection Pump		Direct Injection Pump	
Compression ratio	6.9		7.2		6.7	
Propeller ratio	.643		.593		.643	
Supercharger	Variable Speed		Variable Speed		Variable Speed	
Ratio (s)	10.04 (without slip) **		10.04 (without slip) **		10.39 (-3% slip) *	
Imp. diam. - mm. in.	260	10.25"	265	10.42"	260	10.25"
Diameter - mm. in.	***		***		**	
Bore/Stroke - mm. in.	150/160	5.91"/6.3"	150/160	5.91"/6.3"	150/160	5.91"/6.3"
Displace - ltr. cu.in.	33.9	2070	33.9	2070	33.9	2070
Dry wt. - kg. lbs.	625	1380	715	1576	685	1500

## **INSTALLED IN**

Code name	JUDY 11 JUDY 21	JUDY 12 JUDY 22	TONY 1
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## **REMARKS**

	*** Length - 1722	68"	*** Length - 2150	85"	** Length - 1720	67.7"
	Width - 712	28.0"	Width - 712	28.0"	Width - 712	28.0"
	Height - 1072	42.2"	Height - 1060	41.7"	Height - 1000	39.4"
	** Actual Range - 7.03		** Actual Range - 7.10			
	to 9.7		to 9.7			
	See Page 882.		See Page 883.		See Page 884.	

DATE March 1945

RESTRICTED

UNCLASSIFIED

## DESIGNATION

Model Manufacturer	HOMARE Model 11 Nakajima	HOMARE Model 12 Nakajima	Nakajima
Other designations	Ha 45 Model 11, (NK9B)	Ha 45 Model 12, (NK9-)**	Ha 45 Model 12, (Ha 45)

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	18	18	18

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1795/2900/45.7"/SL	1795/2900/45.7"/SL	1825/2900/46.4"/SL
W.E.P.	1795/2900/45.7"/SL	1795/2900/45.7"/SL	1825/2900/46.4"/SL
W.E.P.	1840/2900/45.7"/3000' *	1840/2900/45.7"/3000' *	1860/2900/46.4"/1800' *
W.E.P.	1610/2900/45.7"/15400'*	1610/2900/45.7"/15400'*	1620/2900/46.4"/15100'*
Military	1540/2900/39.8"/SL	1540/2900/39.8"/SL	1545/2900/39.8"/SL
Military	1625/2900/39.8"/6560'	1625/2900/39.8"/6560'	1645/2900/39.8"/5900'
Military	1420/2900/39.8"/18700'	1420/2900/39.8"/18700'	1420/2900/39.8"/18700'

## FUEL

Cruise and normal T.O./Mil./W.E.P.	92 92 & ADI	92 92 & ADI	
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## CHARACTERISTICS

Fuel metering system	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.
Compression ratio	7.0	7.0	
Propeller ratio	.500 (Farman Type )	.422	
Supercharger	2 Speed	2 Speed	2 Speed
Ratio (s)	5.47 & 7.49	5.47 & 7.49	5.81 & 7.95
Imp.diam.- mm. in.	320 12.6"	320 12.6"	
Diameter - mm. in.	1180 46.5"	1180 46.5"	1180 46.5"
Bore/Stroke-mm. in.	130/150 5.12"/5.91"	130/150 5.12"/5.91"	130/150 5.12"/5.91"
Displace. - ltr. cu.in.	35.8 2185	35.8 2185	35.8 2185
Dry wt. - kg. lbs.	830 1830	830 1830	

## INSTALLED IN

Code name	FRANCES 11 GRACE 11 MYRT 11(?)		FRANK 1
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## REMARKS

	Experimental designa- tion of Army Counterpart - Ha 45 Special	** Possibly NK9C	Army counterpart of Homare 12
	See page 885.		

DATE December 1944

# **ENGINES**

UNCLASSIFIED

## **DESIGNATION**

Model Manufacturer	HOMARE Model 21 Nakajima	Nakajima	HOMARE Model 22 Nakajima
Other designations	Ha 45 Model 21, (NK9H)	Ha 45 Model 21 (**)	Ha 45 Model 22 (NK9K)

## **TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air **	Air	Air (Fan Assisted)**
Number of cylinders	18	18	18

## **PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off	1970/3000/49.6"/SL	1970/3000/49.6"/SL	1970/3000/49.6"/SL
W.E.P.	1970/3000/49.6"/SL	1970/3000/49.6"/SL	
W.E.P.	2050/3000/49.6"/2500' *	2050/3000/49.6"/2500' *	
W.E.P.	1830/3000/49.6"/16500' *	1850/3000/49.6"/17600' *	
Military	1765/3000/43.7"/SL	1765/3000/43.7"/SL	
Military	1875/3000/43.7"/5900'	1875/3000/43.7"/5900'	
Military	1675/3000/43.7"/19600'	1695/3000/43.7"/21000'	1725/3000/43.7"/19600'

## **FUEL**

Cruise and normal T.O./Mil./W.E.P.	91 91 & ADI		92 92 & ADI
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## **CHARACTERISTICS**

Fuel metering system	2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.	
Compression ratio	8.0	8.0	
Propeller ratio	.500 (Farman type)	.500 (Farman type)	.422
Supercharger	2 Speed	2 Speed	
Ratio (s)	5.81 & 7.95		
Imp.diam.- mm.   in.	320   12.6"		
Diameter - mm.   in.	1180   46.5"	1180   46.5"	1180   46.5"
Bore/Stroke-mm.   in.	130/150   5.12"/5.91"	130/150   5.12"/5.91"	130/150   5.12"/5.91"
Displace. - ltr.   cu.in.	35.8   2185	35.8   2185	35.8   2185
Dry wt. - kg.   lbs.	810   1785		

## **INSTALLED IN**

Code name	GEORGE 11 SAM 11 MYRT 11.	FRANK 1	MYRT 11 (?)
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## **REMARKS**

	** One version of the 21, probably experimental, used cooling fan. Captured engine has closer finning than fan version and does not use fan.  See page 886.	** Believed to be engine identified as "Ha 45 improved". Army counter-part of Homare 21.	** Later versions may not use fan. See comments under Homare 21.
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DATE December 1944

UNCLASSIFIED

# UNCLASSIFIED ENGINES

**DESIGNATION**

Model	HOMARE Model 41	TYPE 100 1250 HP	TYPE 2 1450 HP
Manufacturer	Nakajima	Nakajima	Nakajima
Other designations	Ha 45 Model 41, (NK9A)	Ha 34 Model 01, (Ha 41)	Ha 34 Model 11, (Ha 109)

**TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	18	14	14

**PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off		1185/2500/37.8"/SL	1500/2650/41.7"/SL
W.E.P.		1185/2500/37.8"/SL	1500/2650/41.7"/SL
W.E.P.		1320/2500/37.8"/11500'	1570/2650/41.7"/5000' *
W.E.P.			1440/2650/41.7"/15400' *
Military		1105/2450/35.8"/SL	1320/2600/37.8"/SL
Military		1245/2450/35.8"/12100'	1420/2600/37.8"/7050'
Military			1300/2600/37.8"/17200'

**FUEL**

Cruise and normal		92	92) (87
T.O./Mil./W.E.P.		92	92) or (87 & ADI

**CHARACTERISTICS**

Fuel metering system		3 BBL. D.D. Float Carb.	3 BBL.D.D. Float Carb.
Compression ratio		6.7	6.9
Propeller ratio		.6875	.6875
Supercharger		Single Speed	2 Speed
Ratio (s)		8.24	6.54 & 8.65
Imp.diam. - mm. in.		280 11.0"	305 12.0"
Diameter - mm. in.		1260 49.7"	1260 49.7"
Bore/Stroke-mm. in.		146/160 5.75"/6.3"	146/160 5.75"/6.3"
Displace. - ltr. cu.in.		37.5 2290	37.5 2290
Dry wt. - kg. lbs.		639 1380	720 1580

**INSTALLED IN**

Code name	SAM 11	HELEN 1 TOJO 1	HELEN 2 TOJO 2
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**REMARKS**

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See page 887.

DATE December 1944

# UNCLASSIFIED



# **ENGINES**

UNCLASSIFIED

## **DESIGNATION**

Model	TYPE 100 1450 HP	KASEI Model 11	KASEI Model 12
Manufacturer	Mitsubishi	Mitsubishi & Hiro	Mitsubishi
Other designations	Ha 32 Model 11, (Ha 101)	Ha 32 Model 11, (MK4A)	Ha 32 Model 12, (MK4B)

## **TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## **PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off	1490/2450/39.4"/SL	1505/2450/39.8"/SL	1505/2450/39.8"/SL
W.E.P.	1490/2450/39.4"/SL	1505/2450/39.8"/SL	1505/2450/39.8"/SL
W.E.P.	1580/2450/39.4"/7500' *	1580/2450/39.8"/6400' *	1580/2450/39.8"/6400' *
W.E.P.	1470/2450/39.4"/14100' *	1470/2450/39.8"/12800' *	1470/2450/39.8"/12800' *
Military	1310/2350/36.4"/SL	1340/2350/37.0"/SL	1340/2350/37.0"/SL
Military	1445/2350/36.4"/8550'	1460/2350/37.0"/7200'	1460/2350/37.0"/7200'
Military	1360/2350/36.4"/15100'	1360/2350/37.0"/13500'	1360/2350/37.0"/13500'

## **FUEL**

Cruise and normal	92	92	92
T.O./Mil./W.E.P.	92	92	92

## **CHARACTERISTICS**

Fuel metering system	4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.
Compression ratio	6.5	6.5	6.5
Propeller ratio	.684	.684	.500 (Farman type)
Supercharger	2 Speed	2 Speed	2 Speed
Ratio (s)	7.4 & 9.118	7.4 & 9.118	7.4 & 9.118
Imp. diam. - mm. in.	280 11.0"	280 11.0"	280 11.0"
Diameter - mm. in.	1340 52.7"	1340 52.7"	1340 52.7"
Bore/Stroke - mm. in.	150/170 5.91"/6.69"	150/170 5.91"/6.69"	150/170 5.91"/6.69"
Displace. - ltr. cu.in.	42.1 2570	42.1 2570	42.1 2570
Dry wt. - kg. lbs.	1595 *	725 1595	740 1630

## **INSTALLED IN**

Code name	SALLY 2	BETTY 11 and 11 (Trans.) LIZ 11	EMILY 11
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## **REMARKS**

	May be equipped with ADI.		
	See page 888.	See page 888.	See page 888.

DATE December 1974

UNCLASSIFIED

#### DESIGNATION

Model Manufacturer	KASEI Model 13 Mitsubishi	KASEI Model 14 Mitsubishi	KASEI Model 15 Mitsubishi & Hiro
Other designations	Ha 32 Model 13, (MK4C)	Ha 32 Model 14, (MK4D)	Ha 32 Model 15, (MK4C?)

#### TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

#### PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1440/2450/39.8"/SL	1440/2450/39.8"/SL	1440/2450/39.8"/SL
W.E.P.	1440/2450/39.8"/SL	1440/2450/39.8"/SL	1440/2450/39.8"/SL
W.E.P.	1530/2450/39.8"/7800' *	1530/2450/39.8"/7800' *	1530/2450/39.8"/7800' *
W.E.P.	1405/2450/39.8"/19000' **	1405/2450/39.8"/19000' **	1405/2450/39.8"/19000' **
Military	1290/2350/37.0"/SL	1290/2350/37.0"/SL	1290/2350/37.0"/SL
Military	1400/2350/37.0"/8550'	1440/2350/37.0"/8550'	1400/2350/37.0"/8550'
Military	1280/2350/37.0"/19700'	1280/2350/37.0"/19700'	1280/2350/37.0"/19700'

#### FUEL

Cruise and normal T.O./Mil./W.E.P.	92	92 92	92 or 87 (Mits.) 92
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#### CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Float Carb.		4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.
Compression ratio	6.5		6.5	6.5
Propeller ratio	.684		.625**	.684
Supercharger	2 Speed		2 Speed	2 Speed
Ratio (s)	7.0 & 9.118		7.0 & 9.118	7.0 & 9.118
Imp. diam. - mm. in.	320	12.6"	320	320 12.6"
Diameter - mm. in.	1340	52.7"	1340	1340 52.7"
Bore/Stroke - mm. in.	150/170	5.91"/6.69"	150/170	150/170 5.91"/6.69"
Displace. - ltr. cu.in.	42.1	2570	42.1	42.1 2570
Dry wt. - kg. lbs.	770	1700	800	725 1600

#### INSTALLED IN

Code name	REX 11	NORM 11 (?)	BETTY 11
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#### REMARKS

	Has extended propeller shaft.	** Has contra-rotating propellers.	
	See page 889.	See page 889.	

RESTRICTED

DATE December 1944

# **ENGINES**

UNCLASSIFIED

## **DESIGNATION**

Model Manufacturer	KASEI Model 21 Mitsubishi	KASEI Model 22 Mitsubishi	KASEI Model 23 & 23 Kō** Mitsubishi
Other designations	Ha 32 Model 21, (MK4P)	Ha 32 Model 22, (MK4Q)	Ha 32 Model 23, (MK4R)

## **TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air (Fan Assisted)
Number of cylinders	14	14	14

## **PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off	1825/2600/47.7"/SL	1825/2600/47.7"/SL	1870/2600/47.7"/SL
W.E.P.	1825/2600/47.7"/SL	1825/2600/47.7"/SL	1870/2600/47.7"/SL
W.E.P.	1880/2600/47.7"/4400' *	1880/2600/47.7"/4400' *	1940/2600/47.7"/4400' *
W.E.P.	1735/2600/47.7"/16800' *	1735/2600/47.7"/16800' *	1785/2600/47.7"/16600' *
Military	1550/2500/41.7"/SL	1550/2500/41.7"/SL	1580/2500/41.7"/SL
Military	1655/2500/41.7"/6900'	1655/2500/41.7"/6900'	1695/2500/41.7"/6900'
Military	1520/2500/41.7"/18050'	1520/2500/41.7"/18050'	1560/2500/41.7"/18050'

## **FUEL**

Cruise and normal T.O./Mil./ W.E.P.	92 92 & ADI	92 92 & ADI	92 92 & ADI
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## **CHARACTERISTICS**

Fuel metering system	4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.	Direct Injection Pump.
Compression ratio	6.5	6.5	6.5
Propeller ratio	.540	.500 (Farman type)	.540
Supercharger	2 Speed	2 Speed	2 Speed
Ratio (s)	7.0 & 9.118	7.0 & 9.118	7.0 & 9.118
Imp. diam. - mm. in.	320 12.6"	320 12.6"	320 12.6"
Diameter - mm. in.	1340 52.7"	1340 52.7"	1340 52.7"
Bore/Stroke-mm. in.	150/170 5.91"/6.69"	150/170 5.91"/6.69"	150/170 5.91"/6.69"
Displace. - ltr. cu.in.	42.1 2570	42.1 2570	42.1 2570
Dry wt. - kg. lbs.	780 1720	750 1650	860 1895

## **INSTALLED IN**

Code name	BETTY 22 LIZ 11	EMILY 12, 22 & 32 (Trans)	JACK 11
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## **REMARKS**

			** Model 23 Kō is same as Model 23 excepted for generator speed ratio increased to 2.438

See page 890.

DATE December 1944

UNCLASSIFIED

#### DESIGNATION

Model Manufacturer	KASEI Model 24 Mitsubishi	KASEI Model 25 Mitsubishi	KASEI Model 26 Mitsubishi
Other designations	Ha 32 Model 24, (MK4S)	Ha 32 Model 25, (MK4T)	Ha 32 Model 26, (MK4(U?))

#### TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

#### PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1825/2600/47.7"/SL	1825/2600/47.7"/SL	
W.E.P.	1825/2600/47.7"/SL	1825/2600/47.7"/SL	
W.E.P.	1880/2600/47.7"/4400' *	1880/2600/47.7"/4400' *	
W.E.P.	1735/2600/47.7"/16800'*	1735/2600/47.7"/16800'*	
Military	1550/2500/41.7"/SL	1550/2500/41.7"/SL	
Military	1655/2500/41.7"/6900'	1655/2500/41.7"/6900'	
Military	1520/2500/41.7"/18050	1520/2500/41.7"/18050'	

#### FUEL

Cruise and normal T.O./Mil./W.E.P.	92 92 & ADI	92 92 & ADI	
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#### CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.	Direct Injection Pump.**	
Compression ratio	6.5	6.5		
Propeller ratio	.625**	.625		
Supercharger	2 Speed	2 Speed		
Ratio (s)	7.0 & 9.118	7.0 & 9.118		
Imp.diam.- mm. in.	320 12.6"	320 12.6"		
Diameter - mm. in.	1340 52.7"	1340 52.7"		
Bore/Stroke-mm. in.	150/170 5.91"/6.69"	150/170 5.91"/6.69"	1340 52.7"	
Displace. - ltr. cu.in.	42.1 2570	42.1 2570	150/170 5.91"/6.69"	
Dry wt. - kg. lbs.	800 1760	760 1680	42.1 2570	

#### INSTALLED IN

Code name	LUKE 11 (?) NORM 11 (?) REX 11 (?)	BETTY 24 & 34 JILL 12 FRANCES 12 (?)	
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#### REMARKS

	**Has contra-rotating propellers.	Experimental designation of Army Counterpart - Ha 111	Altitude performances increased over Model 23.  ** Probable.
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RE [REDACTED]

DATE December 1944

# ENGINES

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## DESIGNATION

Model Manufacturer	KASEI Model 27 Mitsubishi	MAMORU Model 11	MAMORU Model 12
Other designations	Ha 32 Model 27, (MK4(V?))	(NK7A)	(NK7A)

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air
Number of cylinders	14	14	14

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1795/2600/47.7"/SL	1850/2600/45.6"/SL	1850/2600/45.6"/SL
W.E.P.	1795/2600/47.7"/SL	1850/2600/45.6"/SL	1850/2600/45.6"/SL
W.E.P.	1880/2600/47.7"/6000*		
W.E.P.	1700/2600/47.7"/20,300*		
Military	1560/2500/41.7"/SL	1660/2500/41.7"/SL	1660/2500/41.7"/SL
Military	1670/2500/41.7"/8500'	1730/2500/41.7"/4600'	1730/2500/41.7"/4600'
Military	1480/2500/41.7"/21,600'	1580/2500/41.7"/16,000'	1580/2500/41.7"/16,100'

## FUEL

Cruise and normal T.O./Mil./W.E.P.	87 87 & ADI	92 92	92 92
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## CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Float Carb.**		2 BBL. D.D. Float Carb.	2 BBL. D.D. Float Carb.
Compression ratio	6.5		6.5	6.5
Propeller ratio	.625		.578	.422
Supercharger	2 Speed		2 Speed	2 Speed
Ratio (s)	6.17 & 8.46		6.17 & 8.46	6.17 & 8.46
Imp. diam. - mm. in.	320 12.6"		320 12.6"	320 12.6"
Diameter - mm. in.	1400 55"		1400 55"	1400 55"
Bore/Stroke-mm. in.	150/170	5.91"/6.69"	155/170	6.1"/6.69"
Displace. - ltr. cu.in.	42.1	2570	44.9	2740
Dry wt. - kg. lbs.			885	1960

## INSTALLED IN

Code name	BETTY 25	JILL 11 LIZ 11	JILL 11 LIZ 12 ?
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## REMARKS

	Altitude performances increased over Model 25.  ** Probable		
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See page 891.

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**UNCLASSIFIED**  
**ENGINES**

**DESIGNATION**

Model Manufacturer	MAMORU Model 21 Nakajima	MAMORU Model 22 Nakajima	Jusei Model 11 (?) Mitsubishi
Other designation	(NK7B)	(NK7B)	Ha 42 Model 11 (MK6A)

**TYPE**

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air	Air	Air (Fan assisted)
Number of cylinders	14	14	18

**PERFORMANCE (HP/RPM/AMP/ALT)**

Take-off	1970/2550/48.5" /SL	1970/2550/48.5" /SL	1970/2450/40.7" /SL
W.E.P.	1970/2550/48.5" /SL	1970/2550/48.5" /SL	1970/2450/40.7" /SL
W.E.P.	2020/2550/48.5" /1850' *	2040/2550/48.5" /3200' *	2040/2450/40.7" /3100' *
W.E.P.	1745/2550/48.5" /13600' *	1750/2550/48.5" /16500' *	1860/2450/40.7" /15500' *
Military	1775/2500/43.7" /SL	1700/2500/43.7" /SL	1735/2350/36.6" /SL
Military	1875/2500/43.7" /3940'	1850/2500/43.7" /5600' *	1825/2350/36.6" /4590'
Military	1660/2500/43.7" /14750'	1615/2500/43.7" /18050' *	1665/2350/36.6" /16400'

**FUEL**

Cruise and normal T.O./Mil./Combat	92 92 & ADI	92 92 & ADI	92 92
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**CHARACTERISTICS**

Fuel metering system	2 BBL. D.D. Float Carb.		2 BBL. D.D. Float Carb.	4 BBL. D.D. Float Carb.
Compression ratio	6.5		6.5	6.5
Propeller ratio	.578		.422	.500 (Farman type)
Supercharger	2 Speed		2 Speed	2 Speed
Ratio (s)	6.56 & 9.02		7.04 & 9.64	
Imp. diam. -mm./in.	320 12.6"		320 12.6"	300 11.7"
Diameter -mm./in.	1400 55"		1400 55"	1350 53"
Bore/Stroke-mm./in.	155/170 6.1"/6.69"		155/170 6.1"/6.69"	150/170 5.91"/6.69"
Displace - ltr./cu.in.	44.9 2740		44.9 2740	54.1 3300
Dry wt. - kg./lbs.	899 1990		899 1990	930 2046

**INSTALLED IN**

Code name	JILL 11	JILL 11	
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**REMARKS**

			See Page 892.
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## ENGINES

## DESIGNATION

Model			
Manufacturer	Mitsubishi	Mitsubishi	
Other designation	Ha 42 Model 11 (Ha 104)	Ha 42 Model 21 (MK10C)	Ha 35 Mod.32(Ha115Mod 2)

## TYPE

Cylinder arrangement	Radial	Radial	Radial
Coolant	Air (Fan Assisted)	Air	Air
Number of cylinders	18	18	14

## PERFORMANCE (HP/RPM/AMP/ALT)

Take-off	1890/2450/40.5"/SL		( )
W.E.P.	1890/2450/40.5"/SL		( Probably )
W.E.P.	1985/2450/40.5"/6000' *		( same )
W.E.P.	1810/2450/40.5"/18700' **		( as )
Military	1660/2350/37"/SL		( Sakae 31 A )
Military	1775/2350/37"/7200		( )
Military	1640/2350/37"/20000		( )

## FUEL

Cruise and normal	87		92
T.O./Mil./Combat	91		92

## CHARACTERISTICS

Fuel metering system	4 BBL. D.D. Carb.		2 BBL. D.D. Carb.
Compression ratio	6.5		
Propeller ratio	.588		
Supercharger	2 speed	2 speed	.6875
Ratio (s)	6.68 & 9.35		2 speed
Imp. diam. -mm./in.	325 12.8"		6.37 & 9.00
Diameter -mm./in.	1370 54"	1350 53"	305 12.0"
Bore/Stroke-mm./in.	150/170 5.91"/6.69"	150/170 5.91"/6.69"	1150 45.3"
Displace - ltr./cu.in.	54.1 3300	54.1 3300	130/150 5.12"/5.91"
Dry wt. - kg./lbs.	944 2080		27.9 1700

## INSTALLED IN

Code name	STEVE 1 CLARA 1 PEGGY 1		OSCAR 3
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## REMARKS

	Army counterpart of MK6A.	Experimental designation of Army counterpart-Ha 214 Ru.	
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14 Cyl. RADIAL ENGINES - 130 mm. x 150 mm.

Type 99 - 950 hp (Ha 35, Model 12)

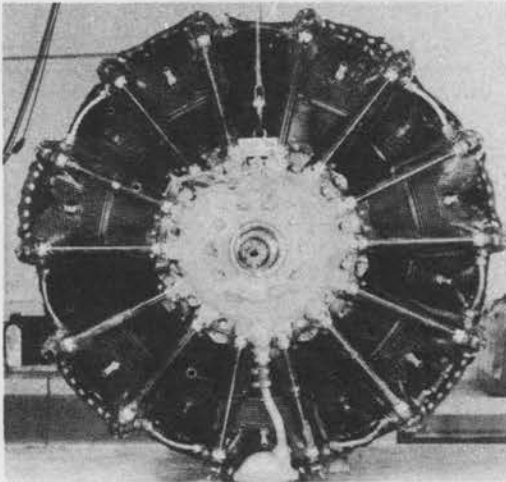


Fig. 1

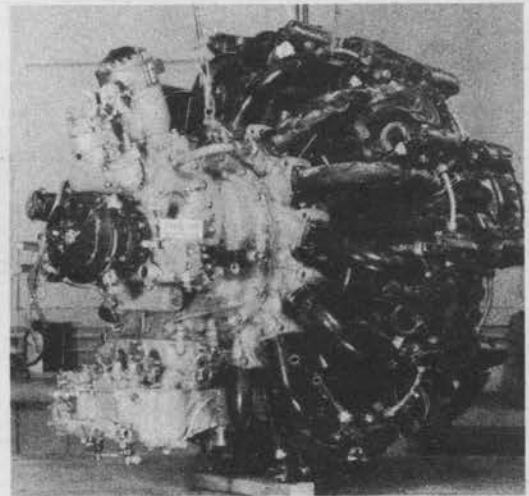


Fig. 2

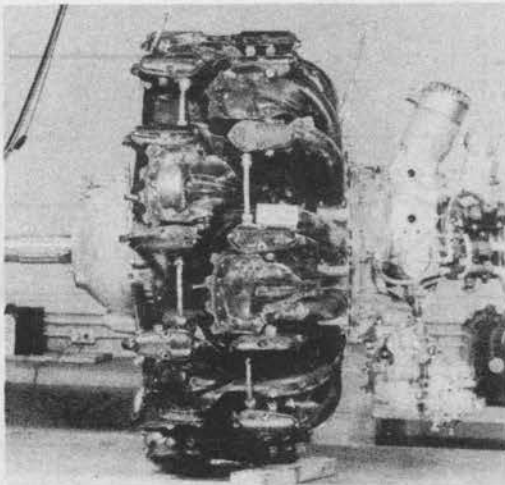


Fig. 3

While this engine has been given the same abbreviated designation as the Sakae 12, it differs slightly in structural details and altitude rating. It is the Army counterpart of the Sakae 12. Diameter - 45.3".

# ENGINES

Sakae 12 (Ha 35, Model 12)

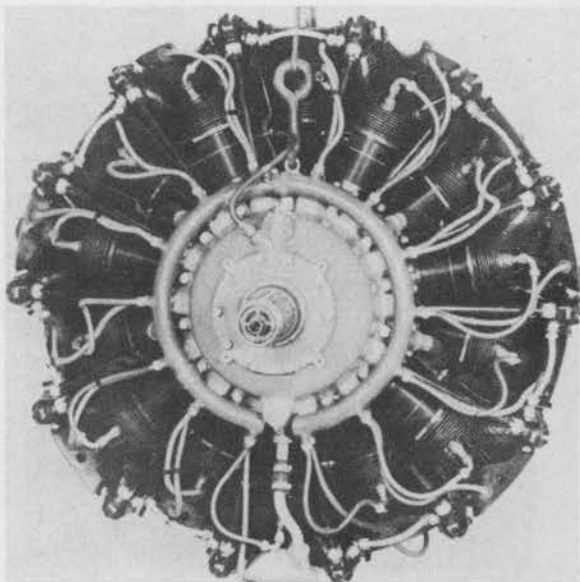


Fig. 4

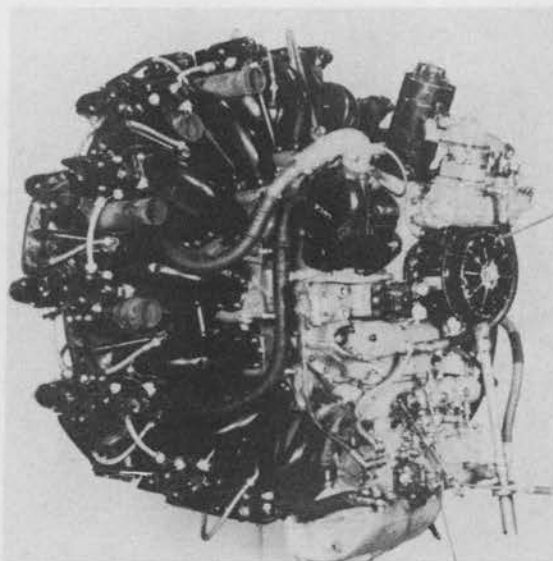


Fig. 5

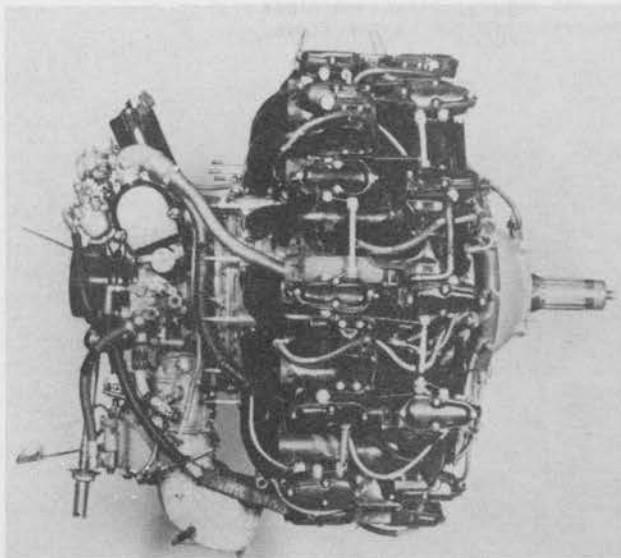


Fig. 6

The Sakae 12, installed in the first Zekes, was the most important Navy fighter engine at the outbreak of hostilities with Japan. It is now obsolescent.

The Sakae 11, the first production model of the Sakae "10" series is, in all essential respects, the same as the Sakae 12 except that it has a lower altitude rating. The "11" and "12" are the only known engines of the Sakae "10" series. Diameter - 45.3".

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TYPE 2 1150 HP (Ha 35 Model 23)

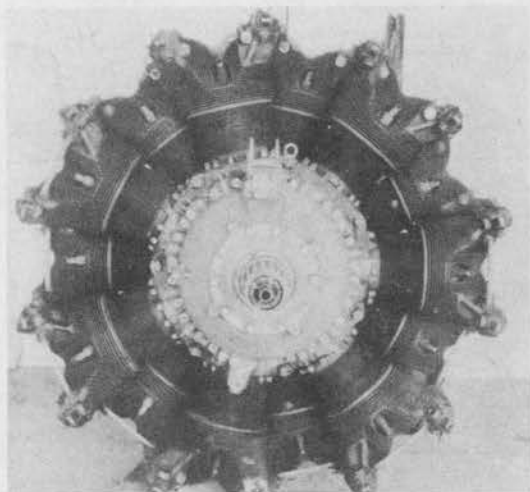


Fig. 7

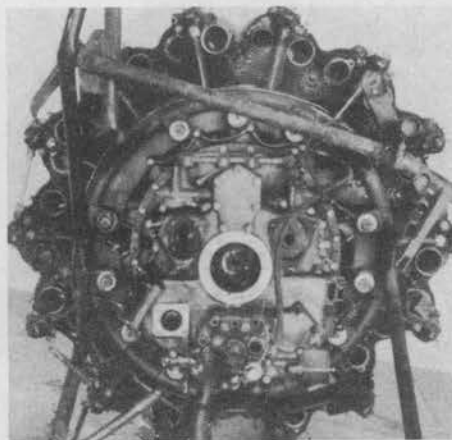


Fig. 8

The Type 2 1150 HP is the Army development of the type 99 950 HP in the same manner that the Sakae "20" series is the Navy development of the "10" series. It differs from the Sakae 21 by the shorter nose section and reduction gear which are the same as its predecessor, the Type 99 950 HP. Compare nose section with the Sakae 31 which is almost identical to the Sakae 21.

Front push rods, rocker box covers, induction pipes and accessories have been removed from the engine shown.

Diameter - 45.3".

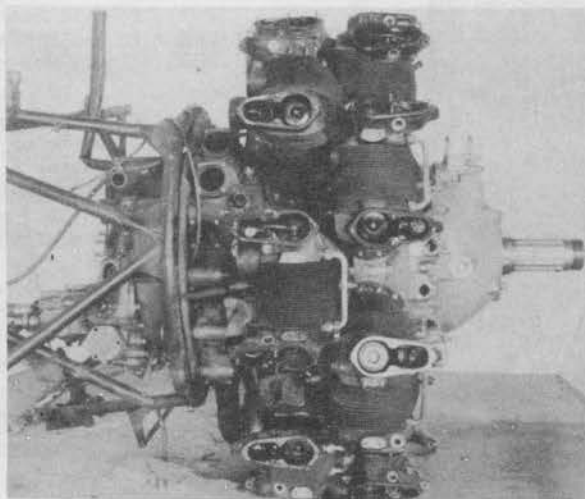


Fig. 9

# ENGINES

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Sakae 31 (Ha 35, Model 31)

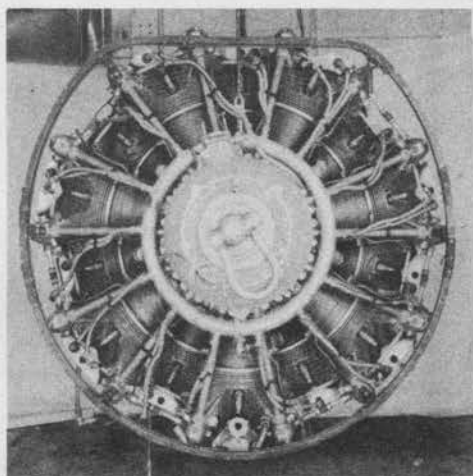


Fig. 10

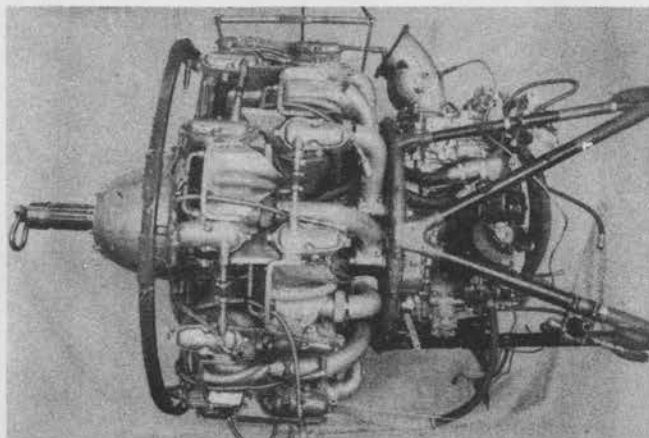


Fig. 11

The second link in the development of the Sakae "10" was the Sakae "20" series (not shown). Principal improvements were two speed supercharger, down draft carburetion and increased cooling area. The Sakae 21 and 22 are the only known engines of the "20" series, the 22 being the same as the 21 except for reversal of direction of propeller rotation.

The Sakae 31, the latest development of the Sakae engines, is substantially the same as the Sakae 21 except that water-methanol injection is used, valve timing has been changed and the second critical altitude increased slightly. It has a 10 minute war emergency rating when water injection is used.

A sub-model, the 31A, is the same as the 31 except that water injection is not used. Documents give its emergency rating as 1 minute.

Another sub-model, the 31B is the same as the 31 except that water injection is not used and supercharger characteristics are the same as the Sakae 31.

Diameter of Sakae 21 and 31 - 45.3".

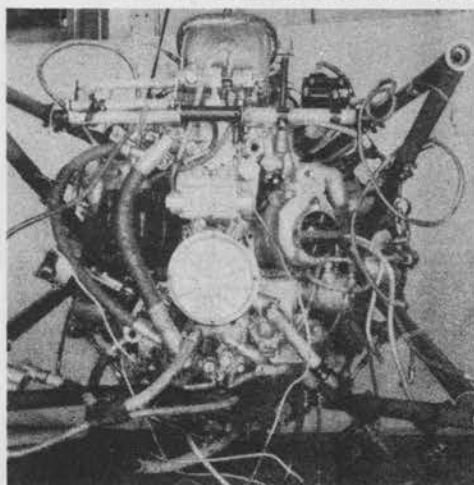


Fig. 12

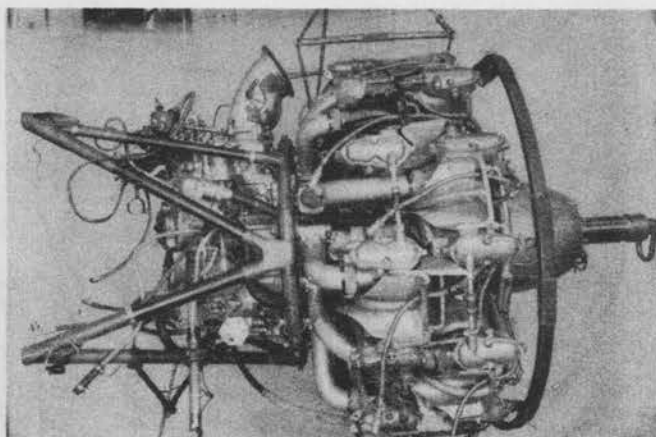


Fig. 13

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14 Cyl. RADIAL ENGINES - 140 mm. x 130 mm.

Type 99 900 hp Model 2 (Ha 31, Model 15)

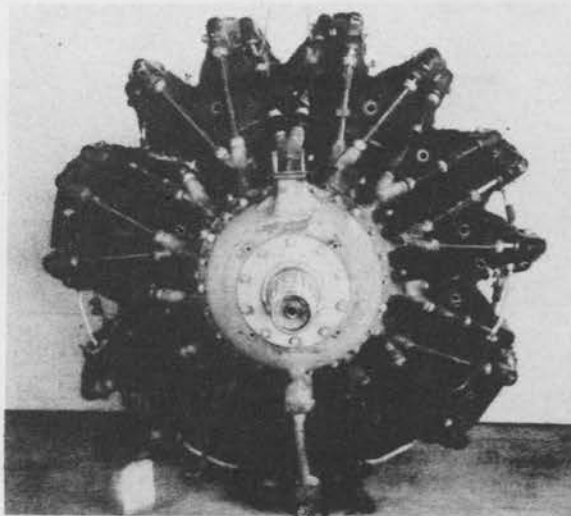


Fig. 14

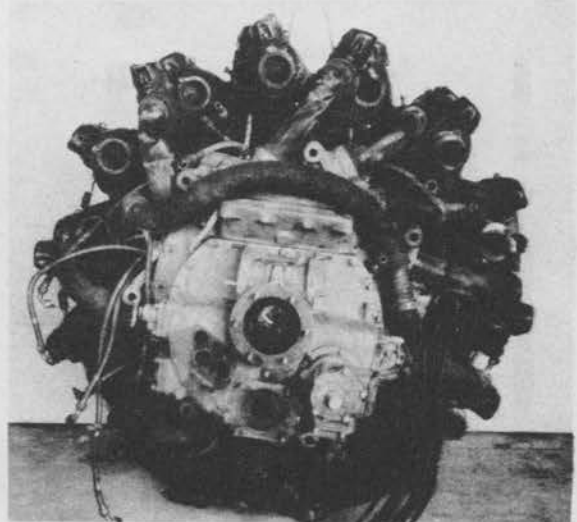


Fig. 15

This engine, together with its related engines, the Zuisel 13 and Type 1 1050 hp, are the only known operational engines having a bore/stroke ratio of less than unity, (.93). They are also the most compact 14 cylinder engines, having an overall diameter of only 44".

The Type 99 900 hp Model 2 is a development of the Model 1 which latter is believed to be the Army version of the Zuisel 13. The Model 1 has never appeared in operation. Both the Model 2 and Zuisel 13 are now obsolescent.

Diameter - 44".

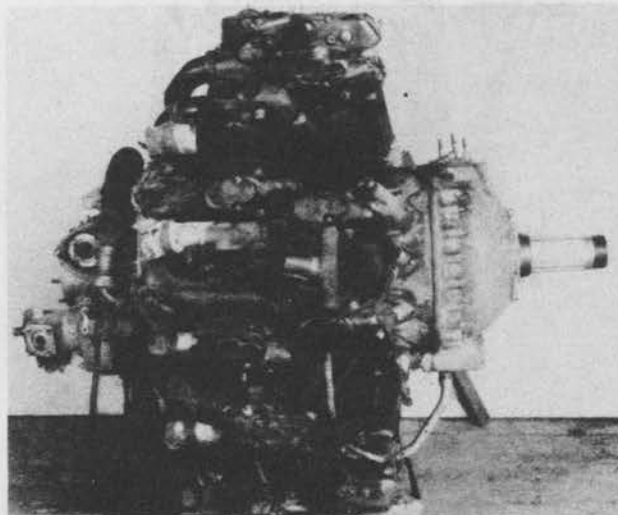


Fig. 16



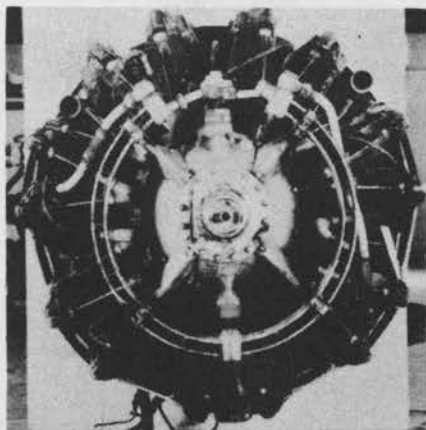
**ENGINES****UNCLASSIFIED**Type 1 1050 hp (Ha 31, Model 21)

Fig. 17

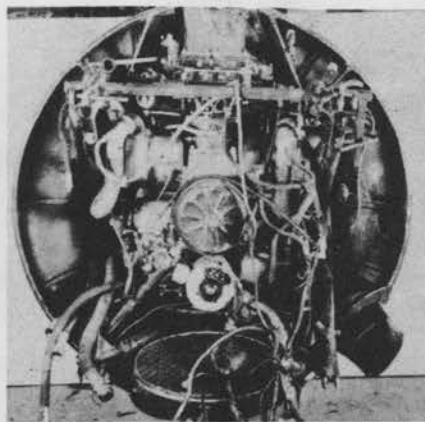


Fig. 18

The Type 1 1050 hp is a direct development of the Type 99 900 hp Model 2. The principal improvement is a two speed supercharger. It is still operational.

Diameter - 44".

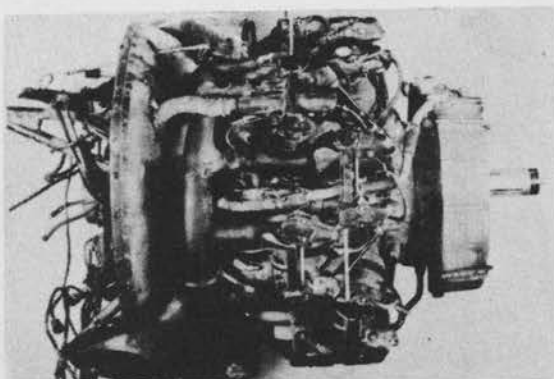


Fig. 19

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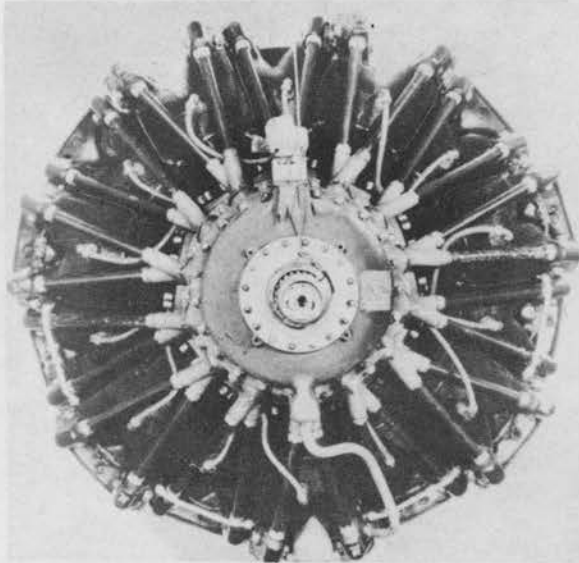
14 Cyl. RADIAL ENGINES - 140 mm. x 150 mm.Kinsei "40" series

Fig. 20

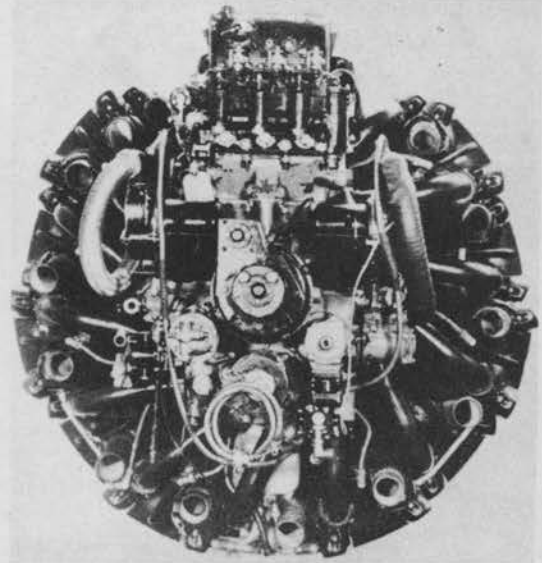


Fig. 21

Engines of this group include models 41 to 44 which are all identical except for accessories. Models 45 and 46 have improved altitude performance over models 41 to 44. All engines of this group are now obsolescent. The engine shown in the Kinsei 44.

Diameter - 48".

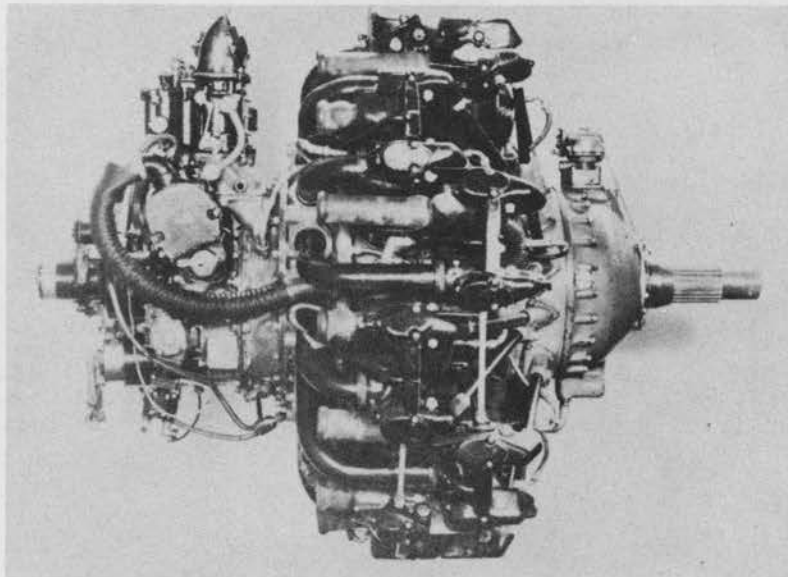


Fig. 22

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## ENGINES

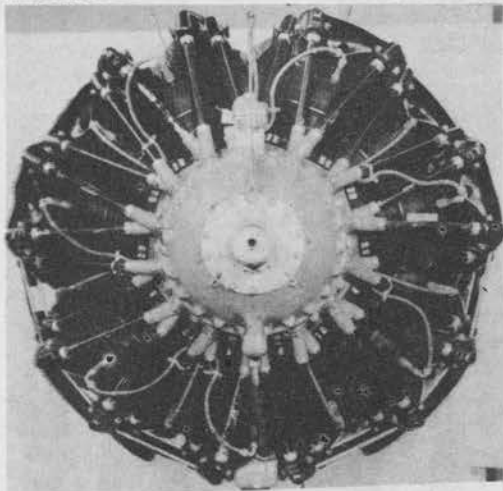
Kinsei "50" Series (Ha 33, Models 51 to 54)

Fig. 23

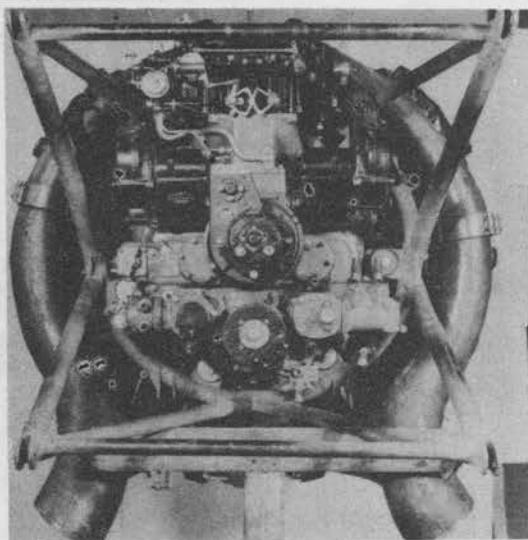


Fig. 24

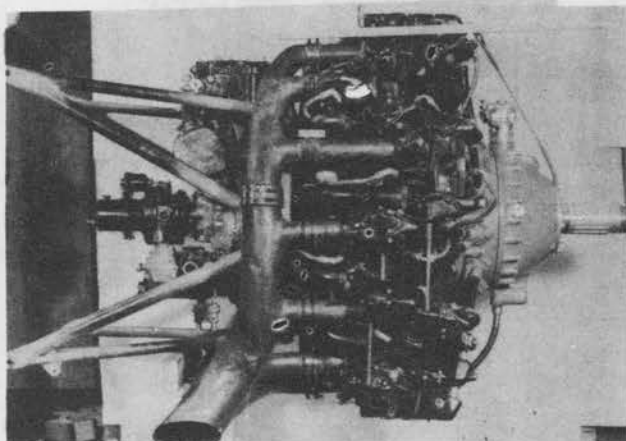


Fig. 25

The Kinsei "50" series consists of four models - 51 to 54 inclusive. All engines of this group are identical except for accessories. They are a direct development of the "40" series, the principal improvements being installation of a two speed supercharger, water injection system and redesigned cylinders. They are all operational. The engine shown is the 54. Diameter - 48".

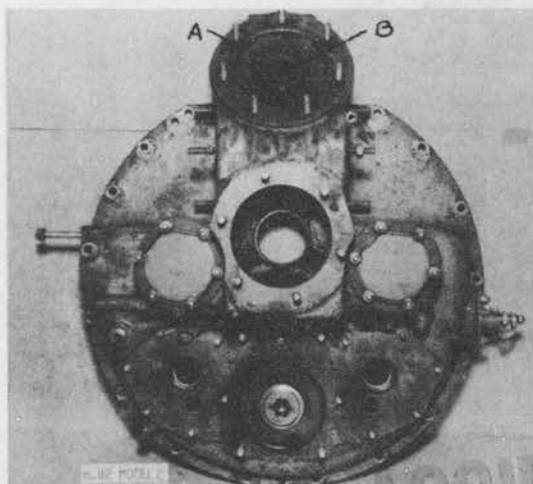
Ha 33 Model 62 (Ha 112 Model 2)

Fig. 26

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The Ha 112, Model 2, is the only operational Japanese radial which uses a direct fuel injector and is identical to the Kinsei 50 series except for the rear case shown in Fig. 13, the installation of injection nozzles, and for a few minor details. The pump is mounted on flange A, driven by shaft B.

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## LIQUID-COOLED ENGINES - 150 mm. x 160 mm.

### Atsuta 21 (Ha 60, Model 21)

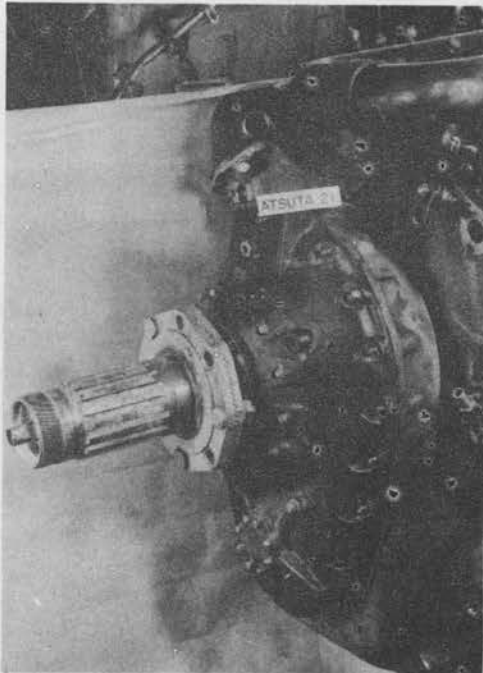


Fig. 27

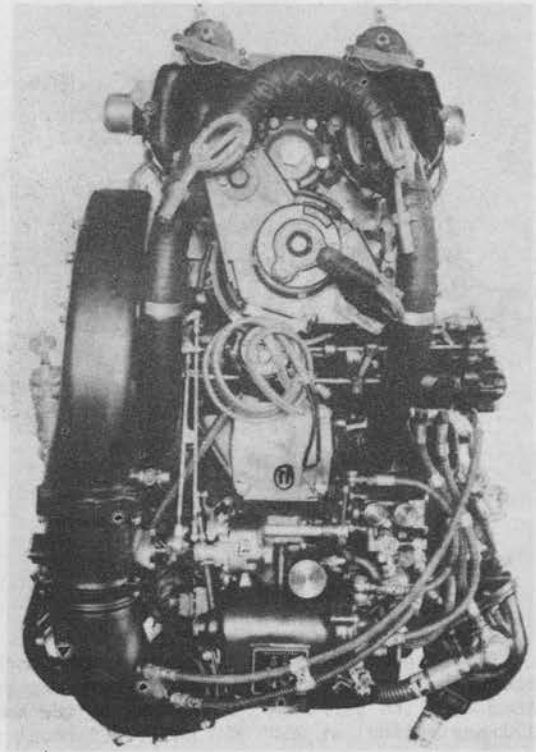


Fig. 28

The Atsuta 21 Navy engine, manufactured by Aichi, is a design copy of the German DB 601A with slight modifications.

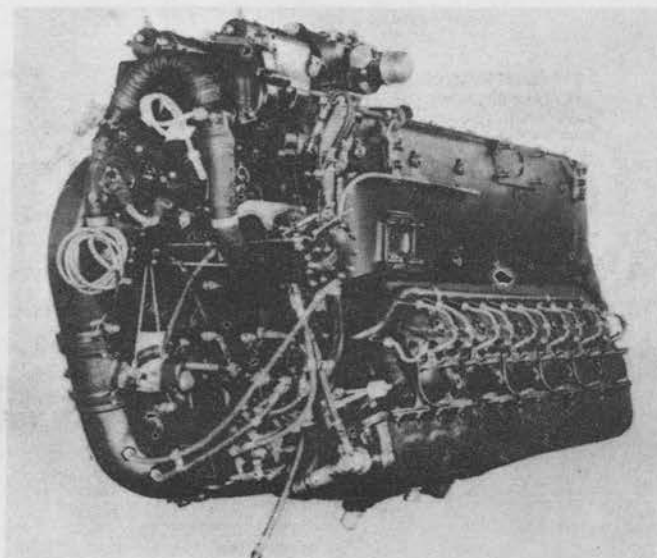


Fig. 29

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# ENGINES

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Atsuta 31 (Ha 60 Model 31)

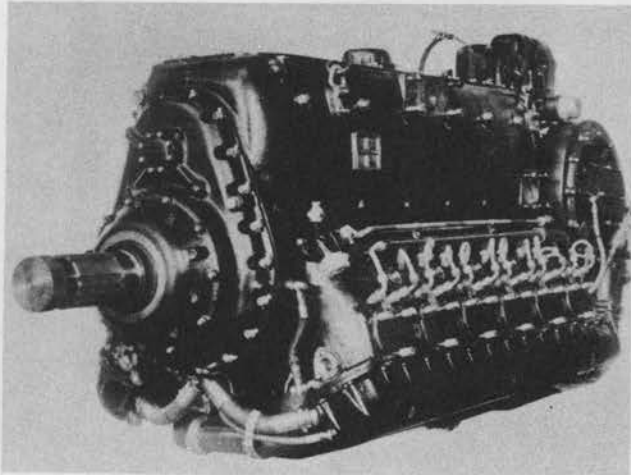


Fig. 30

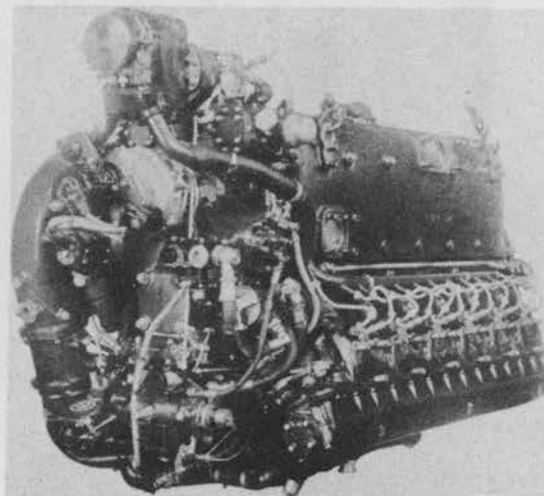


Fig. 31

All structural differences between the Model 31 and 21 are unknown at present. Impeller diameter has been increased slightly and the propeller shaft resembles that of the Type 2 1100 hp rather than the serrated flange type of the Model 21 (See Fig. 27). The 31 is designed to operate (Military rating) at 2600 RPM and 39.8" boost in contrast to 2400 RPM and 35.8" for the 21.

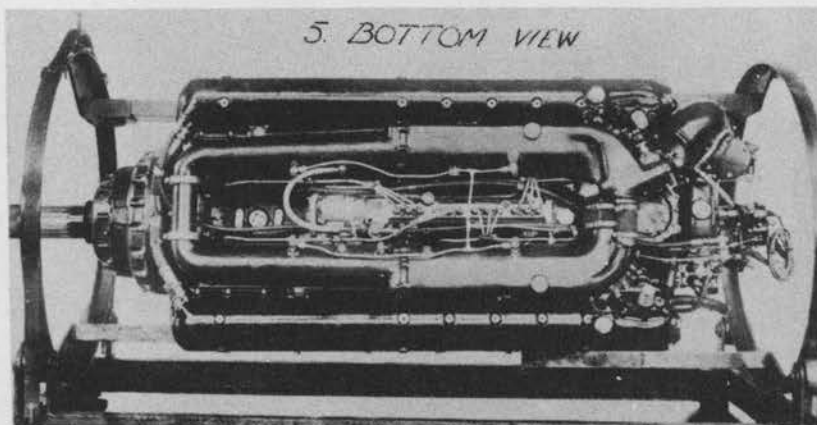


Fig. 32

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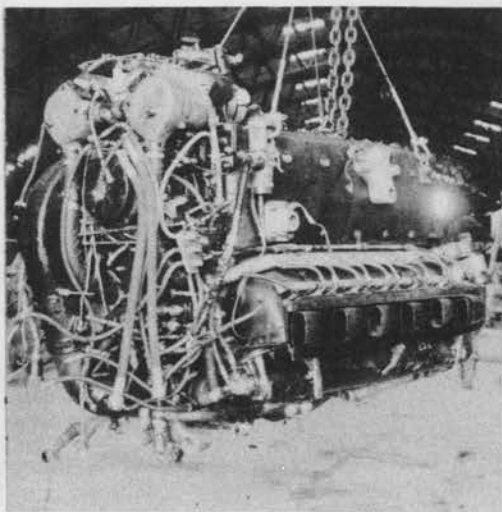
UNCLASSIFIED **ENGINES**Type 2 1100 hp (Ha 60, Model 22)

Fig. 33

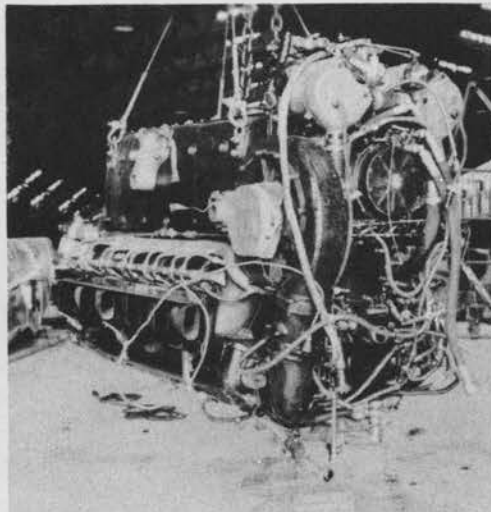


Fig. 34

The Type 2 1100 hp Army engine, manufactured by Kawasaki, is a design copy of the German DB 601A. A few Japanese features have been incorporated, notably the injection pump.

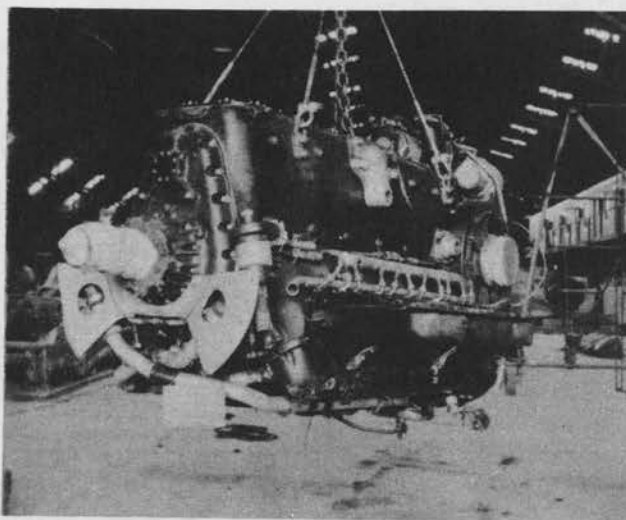


Fig. 35

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# ENGINES

18 Cyl. RADIAL ENGINES - 130 mm.x 150 mm.

Homare 11 (Ha 45, Model 11)

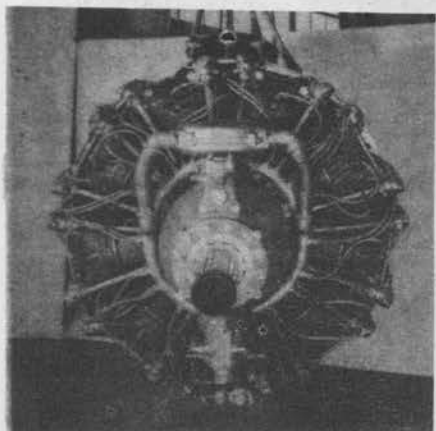


Fig. 36

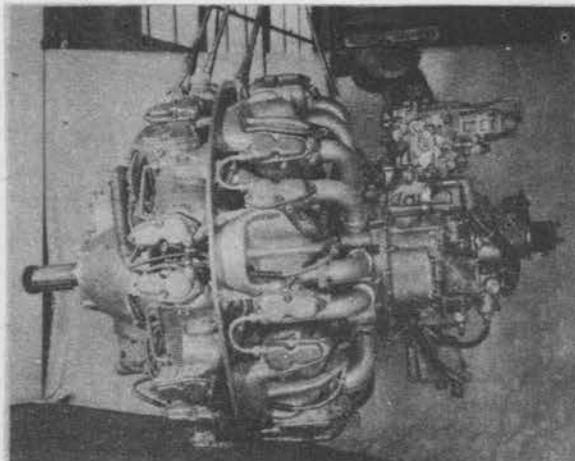


Fig. 37

This 18 cylinder engine is the first production model of the Homare series which is known to include models 11, 12, 21, 22 and 25. While its exact chain of development is not definitely known at present, it is probable that it is a direct development of the Sakae "10" series. Its Army counterpart, originally designated as the Ha 45 special, is, according to documentary evidence, a development of the Type 99 950 hp hence it seems reasonable that the Homare, a Navy engine, is a development of the Sakae.

The diameter of 46.5" represents an increase of only about 1" over the engine from which it developed. It is the most compact 18 cyl. Japanese engine and has the highest specific outputs. Features found for the first time in Jap engines include steel crankcase, dynamic balancers, a dual magneto with remote distributor on nose, and a nose sump with pump. Supercharger drive follows Wright design, having a planetary reduction gear in series with the high gear, for obtaining low ratio. It is equipped with water-methanol injection.

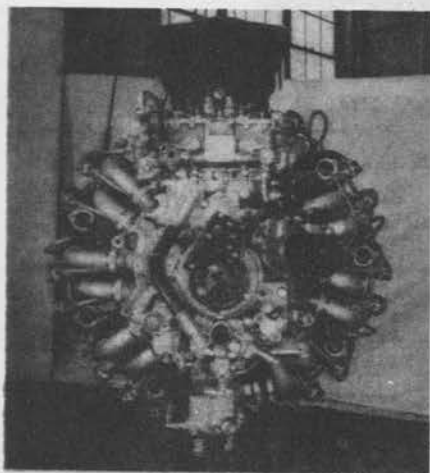


Fig. 38

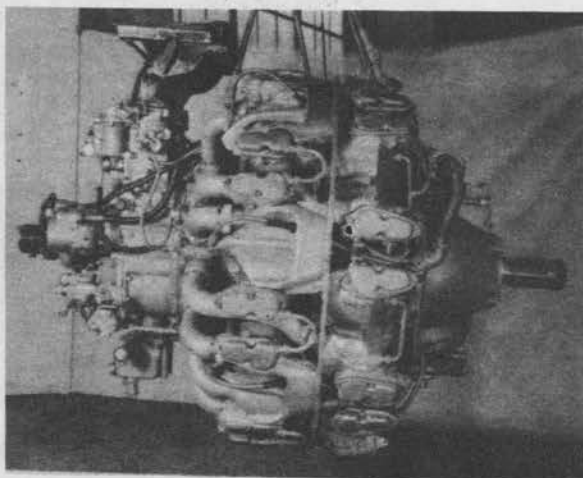


Fig. 39

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Homare 21 (Ha 45 Model 21)

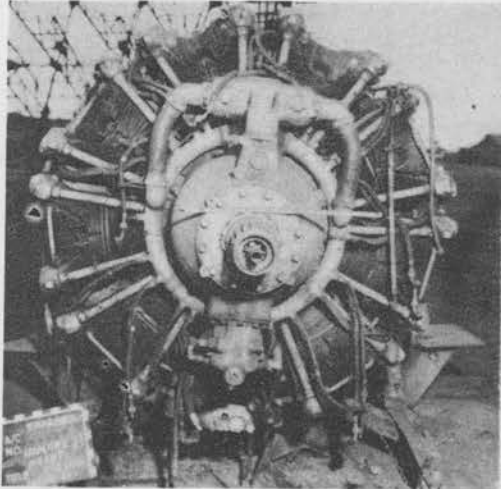


Fig. 40



Fig. 41

Principal changes over the Model 11 include considerable increased cooling fin area by reduction of fin pitch, increase of Take-off RPM and boost from 2900 and 45.7" to 3000 RPM and 49.6" respectively, with subsequent increase of power from 1795 to 1970.

An experimental version of the Homare 21 had cylinder finning similar to the Model 11 and was equipped with a cooling fan. In the operational embodiment the cooling fan has apparently been abandoned in favor of the closer finning.

Diameter - 46.5".

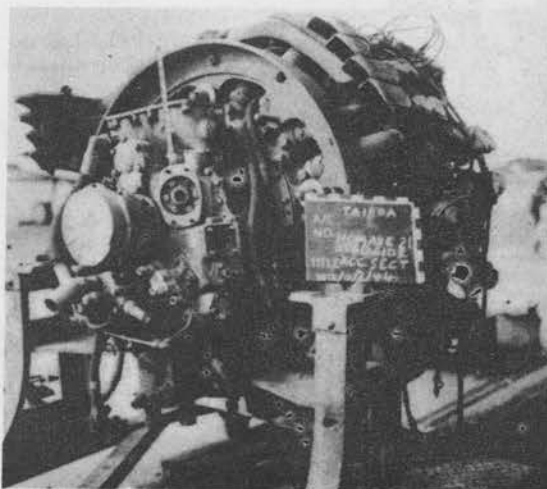


Fig. 42

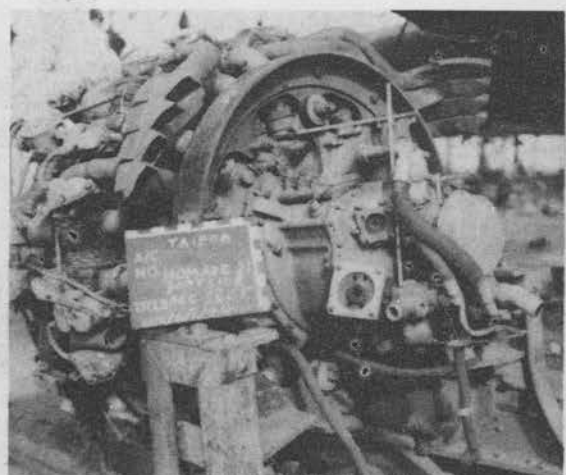


Fig. 43

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# **ENGINES**

14 Cyl. RADIAL ENGINES - 146 mm. x 160 mm.  
Type 2 1450 hp (Ha 34, Model 11)

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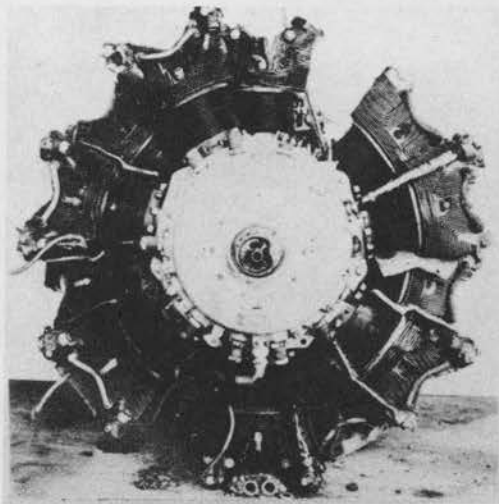


Fig. 44

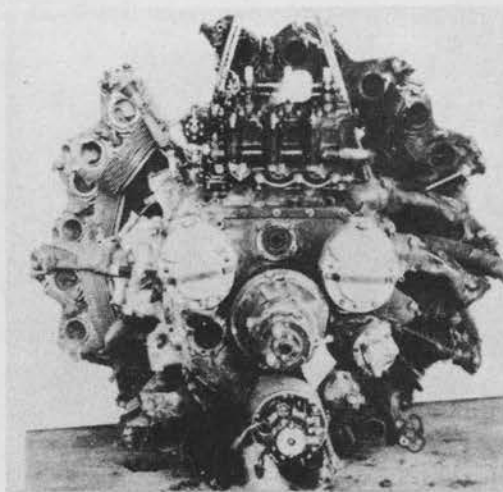


Fig. 45

The Type 2 1450 hp is the two speed version of the Type 100 1250 hp. Its principal feature is compactness. While only 49.7" in diameter as compared to 52.7" for the Kasei "10" series, it develops approximately the same power. It is still important operationally.

Push rods, rocker box covers, induction pipes and one cylinder have been removed from engine shown.

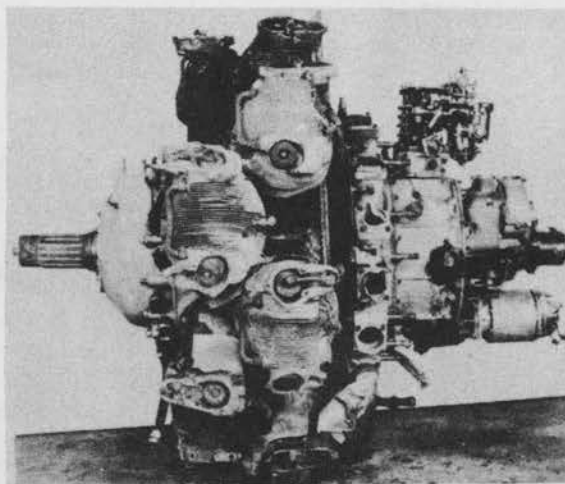


Fig. 46

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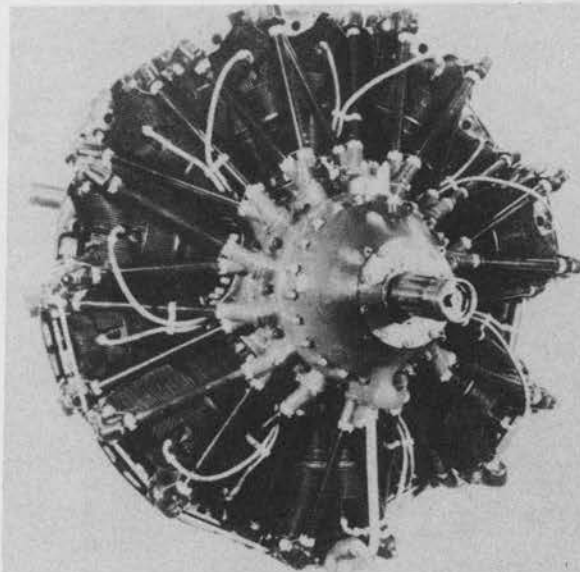
14 Cyl. RADIAL ENGINES 150 mm. x 170 mm.Kasei 11 (Ha 32, Model 11)

Fig. 47

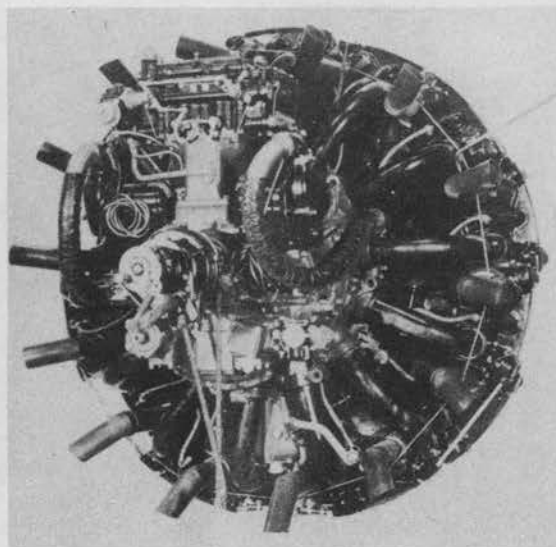


Fig. 48

The Kasei has been one of the most important 14 cylinder engines in the past and will probably remain as such for some time in the future. Engines of this series include the 11 to 15 inclusive, and 21 to 27 inclusive.

The 11 is the first production model of the Kasei series and is identical, except for minor modifications, to the Army Type 100 1450 hp which latter is also designated as the Ha 32 Model 11. (Exhausts are not Japanese equipment).

The Kasei 12 is identical to the 11 except for reduction gear which is of Farman type with ratio of .5. Diameter of all Kasei's - 52.7".

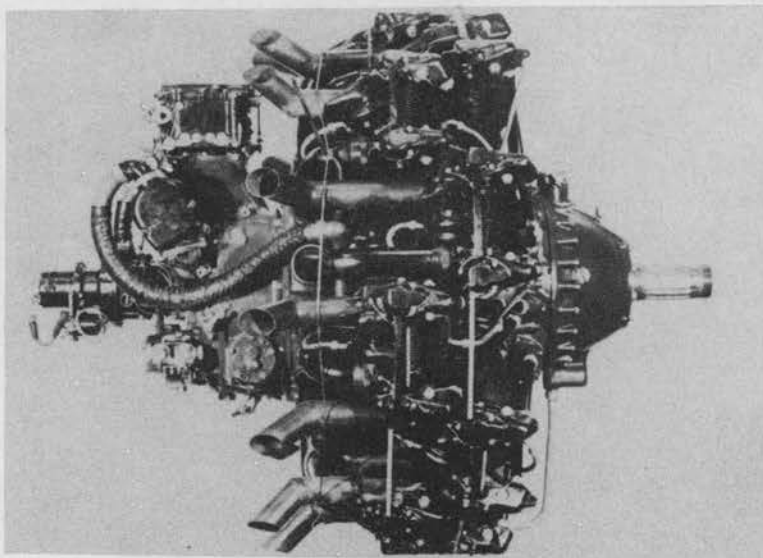


Fig. 49

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## ENGINES

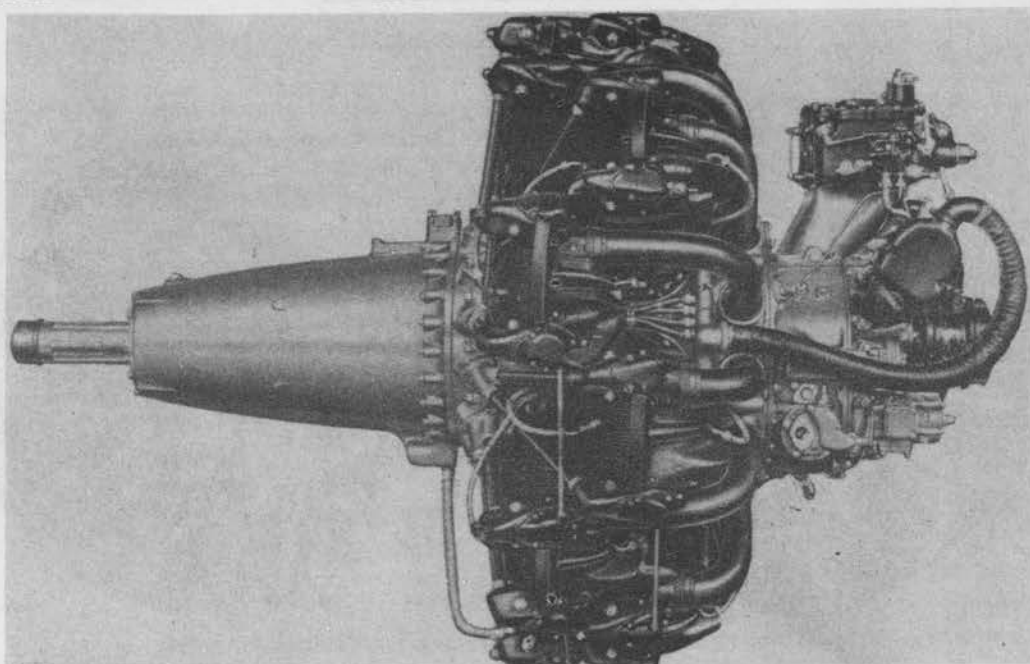
Kasei 13 (Ha 32, Model 13)

Fig. 50

The Kasei 13 to 15 are all substantially identical structurally except for changes in the nose section and reduction gear. All three of these engines have identical performance. The 13 is unique for its extended nose feature.

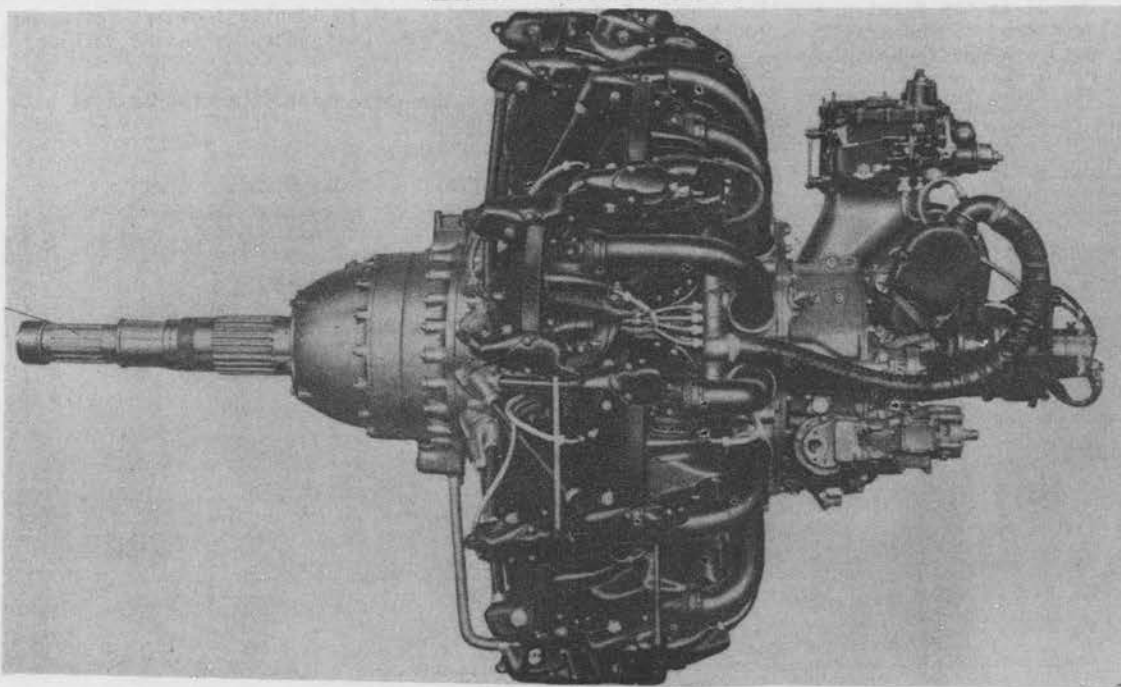
Kasei 14 (Ha 32 Model 14)

Fig. 51

This the first known Jap engine to incorporate contra-rotating propellers. It is quite likely that the same arrangement will be used in the Kasei 24, also a contra-rotating propeller engine.

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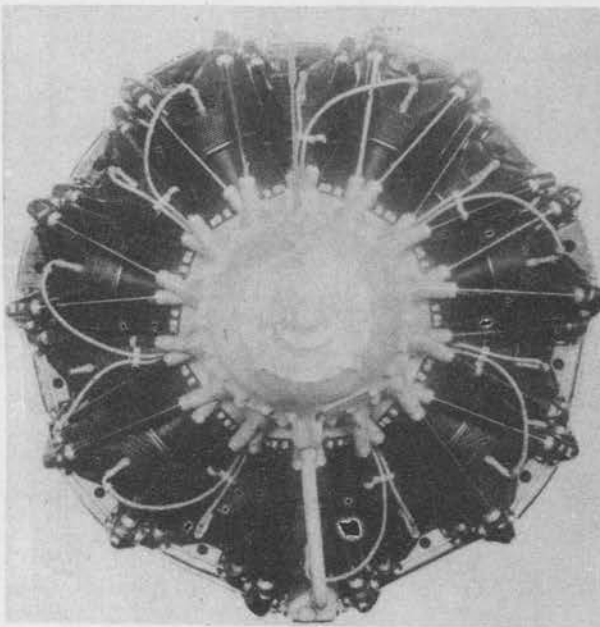
Kasei 22 (Ha 32, Model 22)**ENGINES**

Fig. 52

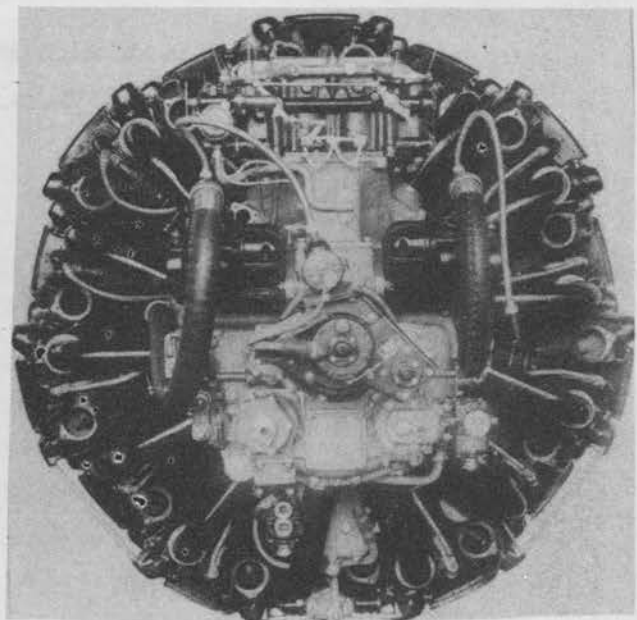


Fig. 53

The principal distinction between the Kasei "10" and "20" series is use of water injection equipment in the latter series. Engines of the "20" series vary principally in nose section and reduction gearing. The 23 is a direct fuel injection engine and the 26 is believed to be a direct fuel injection engine, also. The remainder of the 20 series use carburetors. The 24 has contra-rotating propellers.

Except for the differences above noted, the engine shown is typical of all of the 20 series.

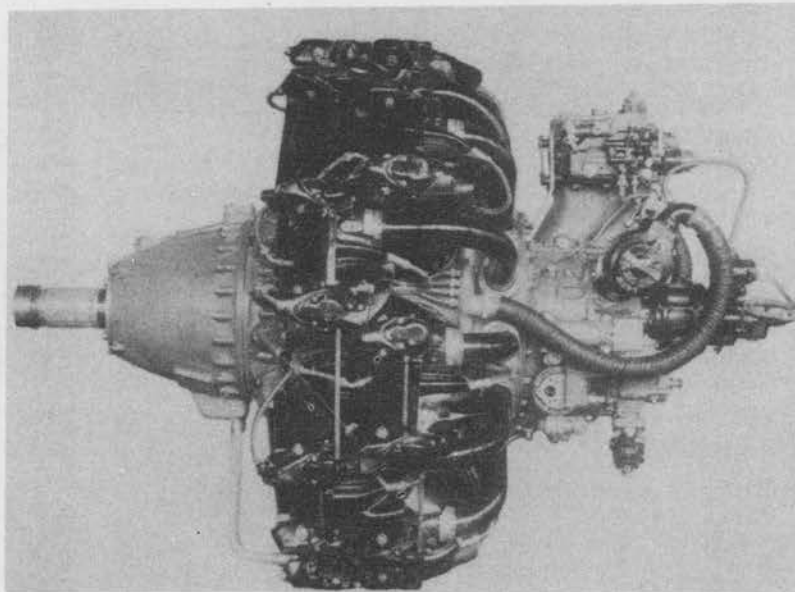


Fig. 54

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# ENGINES

14 Cyl. RADIAL ENGINES - 155 mm. x 170 mm.

Mamoru 11

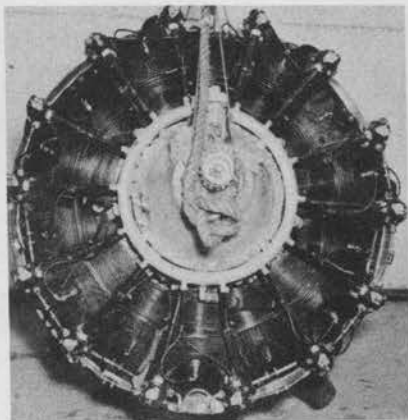


Fig. 55

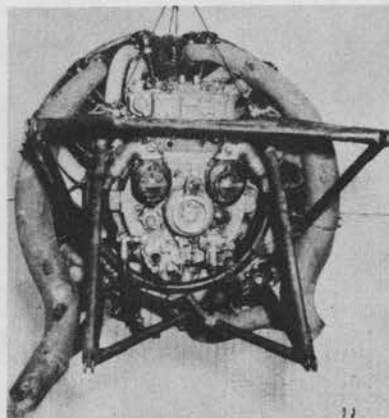


Fig. 56

The only known engines of this bore/stroke class are the Mamorus' which include models 11, 12, 21 and 22. They are the largest 14 cylinder radials having a displacement of 2740 cu. in. and overall diameter of 55".

While the Mamoru 11 is in limited use, its future development is somewhat questionable since several engines of equivalent power and of smaller diameter are now in production.

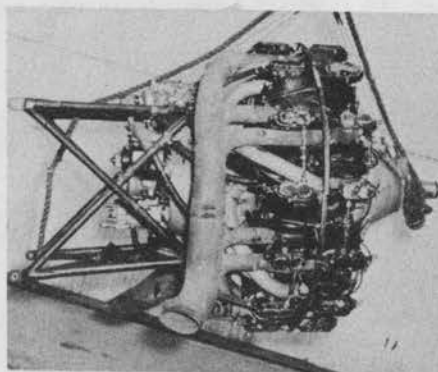


Fig. 57

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## ENGINES

18 Cyl. RADIAL ENGINES -- 150 mm. x 170 mm.

Ha 42. Model 11. (MK6A)

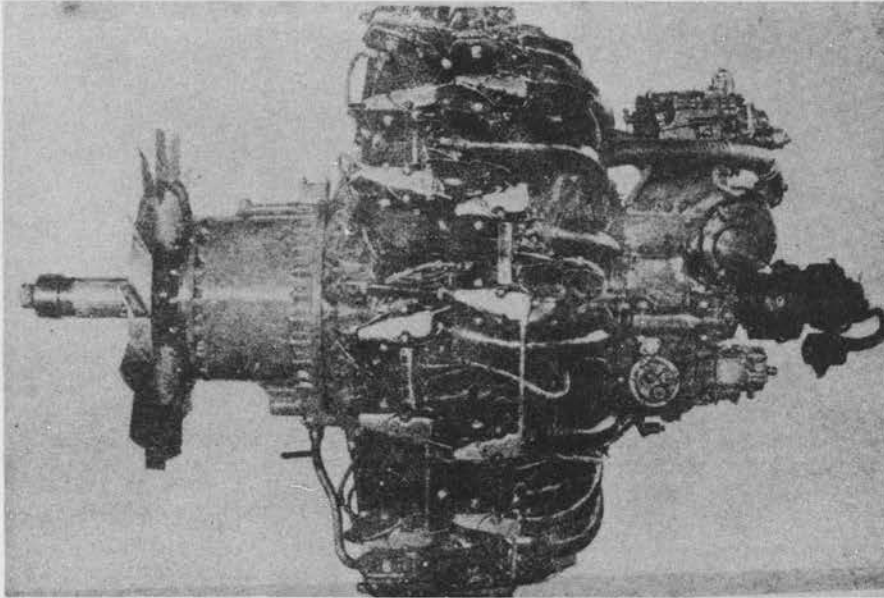


Fig. 58

The 18 cylinder engine shown above is the latest development of the Kasei 14 cylinder engines. It is the largest Japanese 18 cylinder radial, having a displacement of 3300 cu. in. It, together with its Army counterpart also designated as Ha 42 Model 11, (experimental designation Ha 104), are the only known operational engines which use cooling fans. The MK6A is expected to appear operationally in the near future. The Ha 104 recently appeared operationally.

Diameter - 53".

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## ARMAMENT

## JAPANESE AIRCRAFT ARMAMENT

## INTRODUCTION

The study of Japanese Aircraft Armament reveals a failure on their part to standardize on any one particular weapon for each caliber size. The two services, Army and Navy, have carried out separate development projects which have produced many different weapons requiring various types of ammunition.

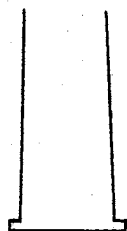
The following pages show the various types of Aircraft Weapons which have been found. Those used by the Army are listed first and those used by the Naval Air Forces are listed last. In selecting the photographs to be used, an attempt has been made to show a side view of each gun and a top view with magazine drum attached.

A few of the terms used should be explained to prevent a possible misinterpretation. First of all, the term, "Effective Range", has been used to give some idea of the comparative performance of each weapon. This figure was derived, not as a result of test, but by a comparison of muzzle velocities and projectile weights of Japanese Weapons with American Weapons of similar caliber. At best, this is an arbitrary figure, for many things will affect the Effective Range. Among them are the method of mounting the gun, the type of sight used, and even the degree of training the gunner has received.

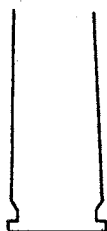
No mention has been made of the sights used on each type of gun, for this varies with the way the gun is mounted. However, it can be said that all flexible mounts use ring and post or ring and Norman Vane sights and all turrets and fixed mounts use reflector sights. No lead computing sights have been recovered to date.

For each weapon, the overall length and weight have been given. In both cases, the figures have been given for the basic gun. In other words, all extra equipment such as solenoids, mounts, and sights have been removed before the gun was weighed or measured.

Each page carries a picture and a description of the various types of ammunition used with each weapon. The terms "Rimmed", "Semi-rimmed", "Rimless", and "Oerlikon" are used to differentiate between the various types of cartridge cases. Since the photographs do not reveal this distinction clearly, a sketch is shown below to illustrate these types.

Cartridge Case Types

Rimmed



Semi-rimmed



Rimless



Oerlikon

In almost all Japanese aircraft ammunition, the Primer is composed of Mercury Fulminate, Potassium Chlorate, Antimony Sulphide, and Grit. The propellant in almost all cases is Graphited Nitrocellulose. The German 20 mm. ammunition uses Nitrocellulose, Nitroglycerine, and Diphenylamine.

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## ARMAMENT

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## SUMMARY OF JAPANESE AIRCRAFT ARMAMENT

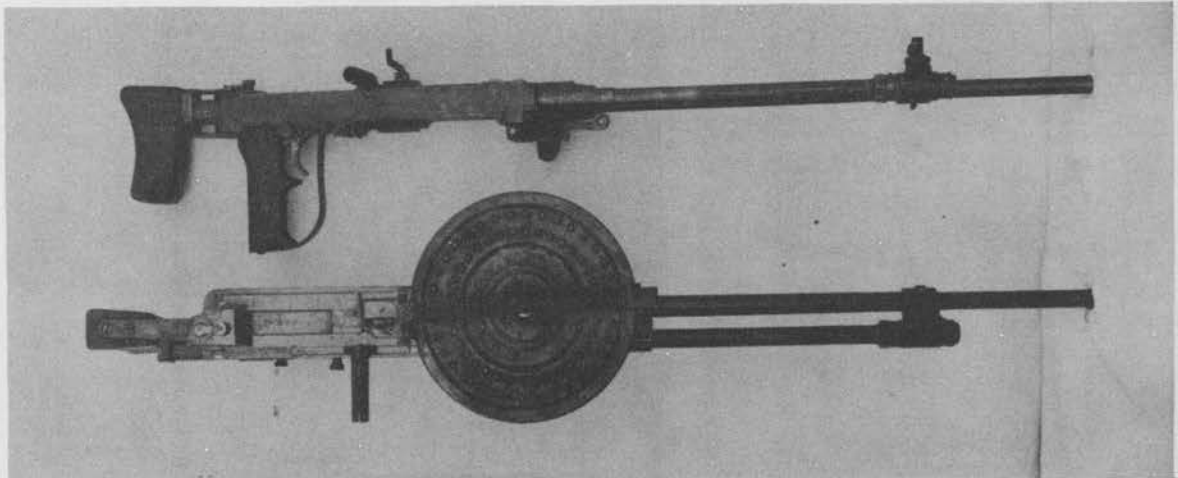
Description				Overall Length	Weight	Effective Range	Rate of Fire	Muzzle Velocity
Sheet No.	Type No.	Bore Diameter	Derivation	Inches	Lbs.	Yds.	Rds/Min.	Ft/Sec.
ARMY AIRCRAFT WEAPONS								
902	Type 89	7.7 mm	Japanese ground machine gun	42.5	20	600	750	2450
903	Type 89 (Special)	7.7 mm	Japanese ground machine gun	38	65	600	1200	2450
904	Type 89 Model 2	7.7 mm	Vickers Type	40.5	26	600	850	2450
907	Type 98	7.92 mm	German MG 15	42.5	15.5	600	1000	2800
909	Type 1 or 100	7.92 mm	Bren Type	37	35	600	1200	2800
912	Type 1	12.7 mm	Browning	49	48	800	900	2500
915	Type 97	20 mm	Cerlikon	69.5	72	1000	300	2500-2900
916	MG 151/20	20 mm	German MG 151/20	69.5	92	800-1000	800	2500
917	Type Ho 5	20 mm	Browning	58	100	-	-	-
924	Type 98	37 mm	French Field Gun	54	269	1000	15-20	2000
NAVAL AIRCRAFT WEAPONS								
931	Type 92	7.7 mm	Lewis	39	18.5	600	600	2500
932	Type 97 Mod. 3 Modification 2	7.7 mm	Vickers	41	27	600	850	2450
941	Type 99 Mk 1	20 mm	Cerlikon	53-62	47-65	800	500	2000
942	Type 99 Mk 2	20 mm	Cerlikon	72	75	1000	500	2500-2700

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## ARMAMENT

## 7.7 mm Type 89 Gas Operated Machine Gun (Army)



## GENERAL

This weapon is a development of a light machine gun used by the Japanese ground forces. The 7.92 mm Type 98 machine gun replaced this weapon in most flexible positions.

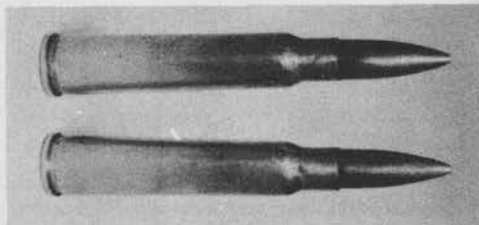
## PERFORMANCE

Rate of Fire (est.)	750 rounds per minute
Muzzle Velocity (est.)	2450 feet per second
Effective Range (est.)	600 yards

## CHARACTERISTICS

Calibre	.303 inches (7.7 mm)
Overall Length	42.5 inches
Weight of Gun	20 pounds
Type of Feed	Flat Drum Magazine
Magazine Capacity	69 rounds
Wt. Magazine Empty	5.3 pounds
Wt. Magazine Full	10.5 pounds
Wt. 100 Linked rds.	-
Charging System	Hand
Firing System	Hand-trigger

A



B

A - Armor Piercing

B - Incendiary

The explosive round has a flat nose; all others are pointed like those above.

## AMMUNITION

Overall Length	3.15 inches
Case	Semi-rimmed

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Red Band	13.1
AP	Black Band	10.5
Tracer	Green Band	10.0
Incend.	Wine Red Band	10.6
HE	Deep Purple Band	10.7
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

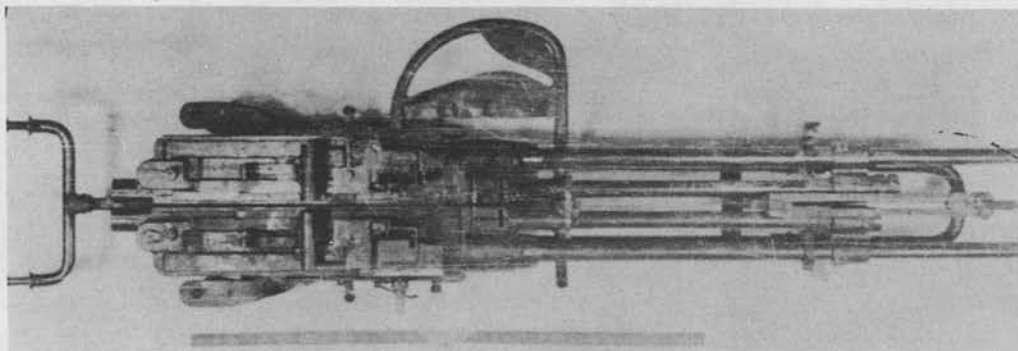
TYPE	CONTENTS
Incend.	Phosphorous
HE	PETN
HE/I	



## ARMAMENT

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7.7 mm Type 89 (Special) Gas Operated Machine Gun (Army)



## GENERAL

This is a development of the Type 89 gas operated gun shown on the previous page. A left and a right hand gun are mounted on a light tubular frame and fed by two quadrant shaped magazines.

## PERFORMANCE

Rate of Fire (est.) 1200 rounds per minute  
 Muzzle Velocity (est.) 2450 feet per second  
 Effective Range (est.) 600 yards

## CHARACTERISTICS

Calibre .303 inches (7.7 mm)  
 Overall Length 38 inches  
 Weight of Gun 65 pounds  
 Type of Feed Segment of Flat Drum Magazine  
 Magazine Capacity 90 rounds per magazine  
 Wt. Magazine Empty 6.75 pounds  
 Wt. Magazine Full 12.0 pounds  
 Wt. 100 Linked rds. -  
 Charging System Hand  
 Firing System Hand Trigger

A



B



A - Armor Piercing

B - Incendiary

The explosive round has a flat nose; all others are pointed like those above.

## AMMUNITION

Overall Length	3.15 inches	
Case	Semi-rimmed	
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Red Band	13.1
AP	Black Band	10.5
Tracer	Green Band	10.0
Incend	Wine Red Band	10.6
HE	Deep Purple Band	10.7
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Phosphorous	
HE	PETN	
HE/I		

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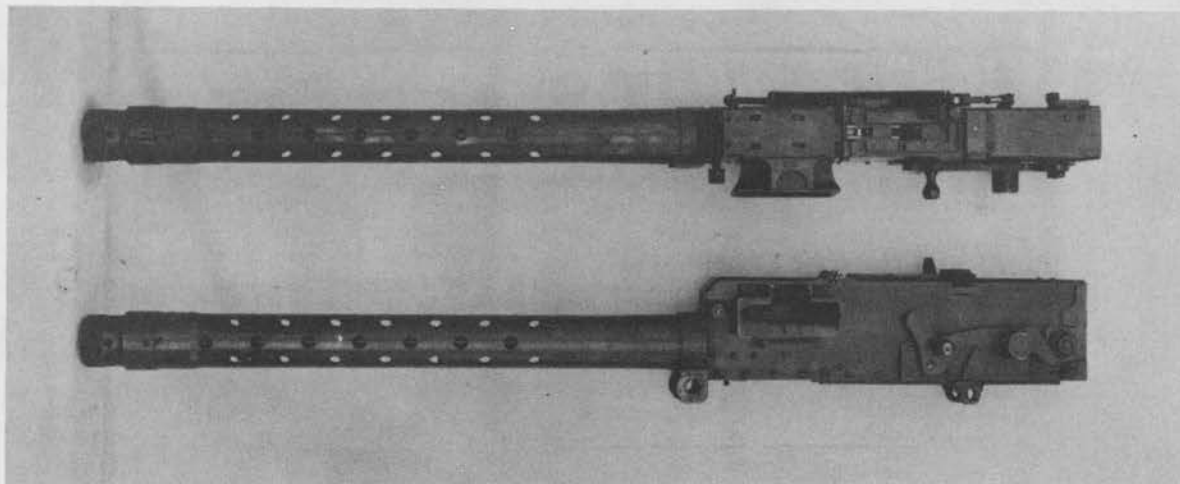
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## ARMAMENT

## 7.7 mm Type 89 Model 2 (Vickers) Machine Gun (Army)



## GENERAL

This Army weapon is basically the same as the Type 97 which is used by the Navy. Though the caliber of the two weapons is the same, ammunition for one cannot be used in the other. The Army Type 89 uses semi-rimmed ammunition and the Navy Type 97 uses rimmed ammunition.

## PERFORMANCE

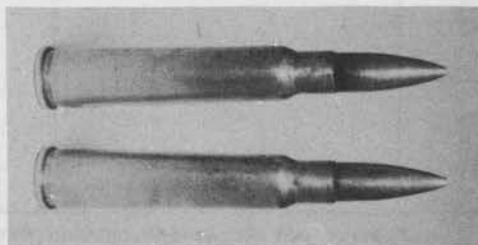
Rate of Fire (est.) 850 rounds per minute  
Muzzle Velocity (est.) 2450 feet per second  
Effective Range (est.) 600 yards

## CHARACTERISTICS

Calibre .303 inches (7.7 mm)  
Overall Length 40.5 inches  
Weight of Gun 26 pounds  
Type of Feed Disintegrating Metal Link Belt  
Magazine Capacity -  
Wt. Magazine Empty -  
Wt. Magazine Full -  
Wt. 100 Linked rds. 8 pounds  
Charging System Hand-lever or Cable  
Firing System Mechanical

A

B



A - Armor Piercing  
B - Incendiary

The explosive round has a flat nose; all others are pointed like those above.

## AMMUNITION

Overall Length 3.15 inches  
Case Semi-rimmed

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Red Band	13.1
AP	Black Band	10.5
Tracer	Green Band	10.0
Incend.	Wine Red Band	10.6
HE	Deep Purple Band	10.7
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

TYPE	CONTENTS
Incend.	Phosphorous
HE	PETN
HE/I	

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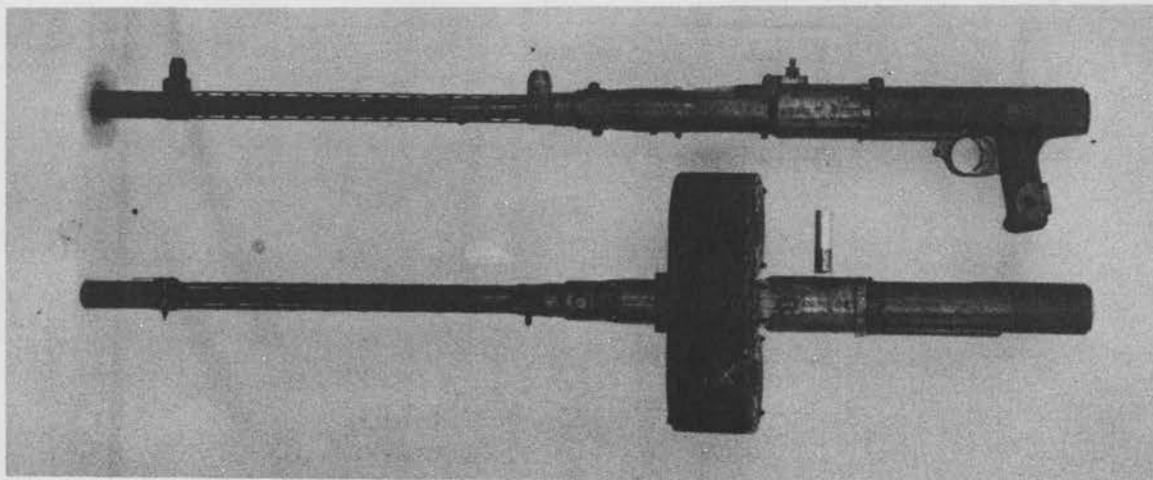
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## ARMAMENT

7.92 mm Type 98 (German MG 15) Machine Gun (Army)



## GENERAL

This weapon is a Japanese copy of the German MG 15. Because of its high rate of fire, it has been widely used as a flexible weapon in Army planes.

## PERFORMANCE

Rate of Fire (est.) 1000 rounds per minute  
Muzzle Velocity (est.) 2800 feet per second  
Effective Range (est.) 600 yards

## CHARACTERISTICS

Calibre .312 inches (7.92 mm)  
Overall Length 42.5 inches  
Weight of Gun 15.5 pounds  
Type of Feed Saddle Drum Magazine

Magazine Capacity 75 rds. (total in both drums)  
Wt. Magazine Empty 5.5 pounds  
Wt. Magazine Full 10.0 pounds  
Wt. 100 Linked rds. -  
Charging System Hand  
Firing System Hand-trigger

A



B



A - Incendiary (Pointed Nose)

B - High Explosive (Flat Nose)

## AMMUNITION

Overall Length 3.15 inches  
Case Rimless

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball		
AP	Black Band	11.6
Tracer		
Incend.	Red Band	9.3
HE	White Band	11.64
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

TYPE	CONTENTS
Incend.	Phosphorous
HE	PETN
HE/I	

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ARMAMENT

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## GENERAL

PERFORMANCE		AMMUNITION	
Rate of Fire (est.) Muzzle Velocity (est.) Effective Range (est.)		Overall Length Case	
<b>CHARACTERISTICS</b>		<b>TYPE</b>	<b>COLOR CODE</b>
Calibre Overall Length Weight of Gun Type of Feed  Magazine Capacity Wt. Magazine Empty Wt. Magazine Full Wt. 100 Linked rds. Charging System Firing System		Ball  AP  Tracer  Incend.  HE   AP/T HE/I HE/AP HE/T AP/I	<b>PROJECTILE WT. (Grams)</b>
		<b>EXPLOSIVE AND INCENDIARY COMPONENTS</b>	
		<b>TYPE</b>	<b>CONTENTS</b>
		Incend.  HE  HE/I	

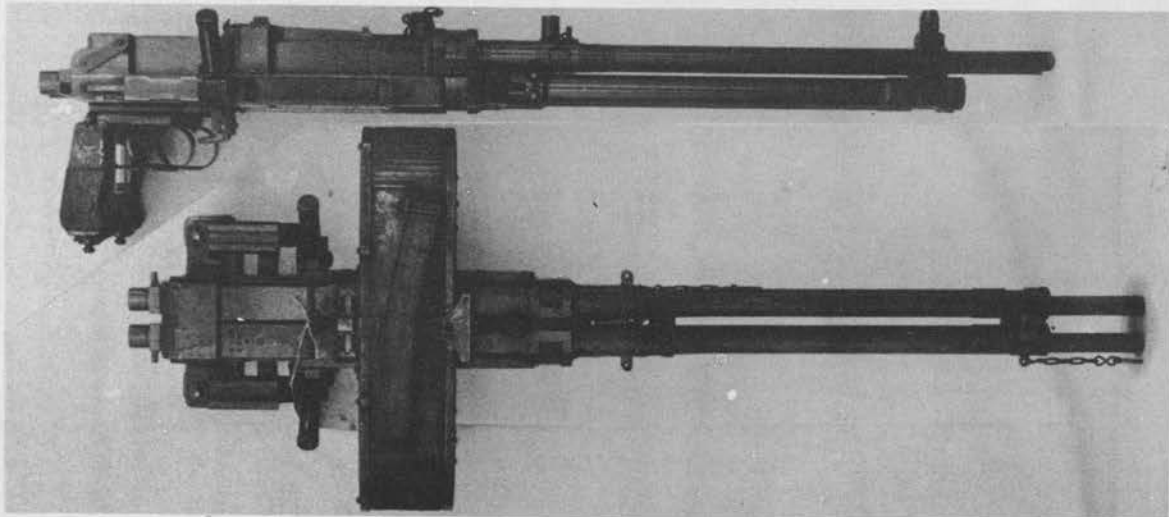
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## ARMAMENT

7.92 mm Type 1 (Type 100) Double-barrel Machine Gun (Army)



## GENERAL

This double-barrel machine gun is so designed that either unit can function independently of the other in case a jam occurs. This weapon has been found designated as Type 1 or as Type 100. No difference between the two types has been noted.

## PERFORMANCE

Rate of Fire (est.) 1200 rounds per minute  
 Muzzle Velocity (est.) 2800 feet per second  
 Effective Range (est.) 600 yards

## CHARACTERISTICS

Calibre .312 inches (7.92 mm)  
 Overall Length 37 inches  
 Weight of Gun 35 pounds  
 Type of Feed Saddle Drum Magazine  
 Magazine Capacity 100 rds. (total in both drums)  
 Wt. Magazine Empty 7.8 pounds  
 Wt. Magazine Full 13.8 pounds  
 Wt. 100 Linked rds. -  
 Charging System Hand  
 Firing System Hand-trigger

A



B



A - Incendiary (Pointed Nose)  
 B - High Explosive (Flat Nose)

## AMMUNITION

Overall Length	3.15 inches	
Case	Rimless	
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball		
AP	Black band	11.6
Tracer		
Incend.	Red band	9.3
HE	White band	11.64
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Phosphorous	
HE	PETN	
HE/I		

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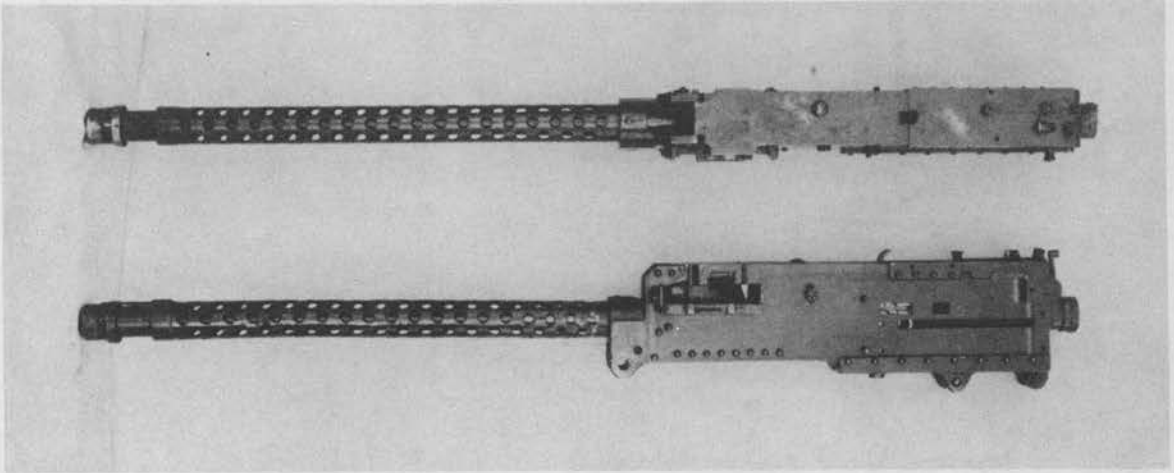
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## ARMAMENT

## 12.7 mm Type 1 (Browning) Machine Gun (Army)



## GENERAL

This weapon, with minor differences, is the same as an early model of the U.S. .50 caliber Browning machine gun. The feed is not interchangeable from left to right.

## PERFORMANCE

Rate of Fire (est.)	900 rounds per minute
Muzzle Velocity (est.)	2500 feet per second
Effective Range (est.)	800 yards

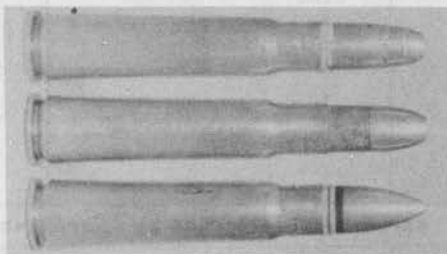
## CHARACTERISTICS

Calibre	.50 inches (12.7 mm)
Overall Length	49 inches
Weight of Gun	48 pounds
Type of Feed	Disintegrating Metal Link Belt
Magazine Capacity	-
Wt. Magazine Empty	-
Wt. Magazine Full	-
Wt. 100 Linked rds.	20 pounds
Charging System	Manual or Hydraulic
Firing System	Electrical

A

B

C



A - HE

B - HE/I (Italian manufacture)

C - AP/T

## AMMUNITION

Overall Length	4.18 inches	
Case	Semi-rimmed	
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Red band	35.98
AP		
Tracer		
Incend.		
HE	White band	35.40
AP/T	Green and white or black band	36.8
HE/I	Red, blue or green body, or deep purple (Black) band	39.1
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Aluminum, Potassium Chlorate, and organic matter	
HE	PETN	
HE/I		

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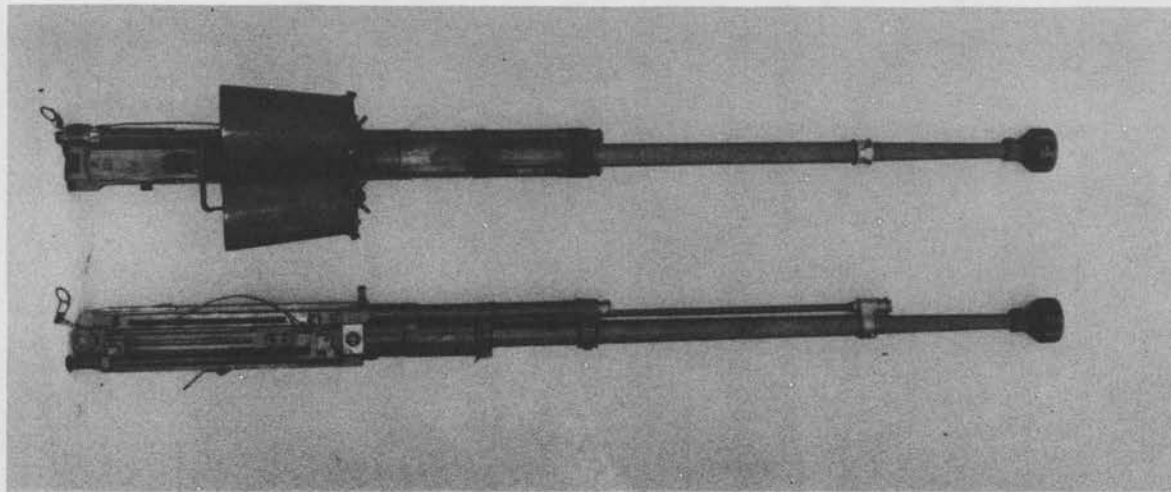
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## ARMAMENT

20 mm Type 97 (Gas Operated) Aircraft Cannon (Army)



## GENERAL

This weapon is believed to have a high muzzle velocity but its effectiveness is reduced by its slow rate of fire. It is an adaptation of a Japanese anti-tank weapon.

## PERFORMANCE

Rate of Fire (est.) 300 rounds per minute  
 Muzzle Velocity (est.) 2500-2900 feet per second  
 Effective Range (est.) 1000 yards

## CHARACTERISTICS

Calibre .79 inches (20 mm)  
 Overall Length 69.5 inches  
 Weight of Gun 72 pounds  
 Type of Feed Inverted Saddle Drum Magazine  
 Magazine Capacity (a) 15 rds. (b) 50 rds.  
 Wt. Magazine Empty 12 lbs. Unknown  
 Wt. Magazine Full 20 lbs. Unknown  
 Wt. 100 Linked rds. -  
 Charging System Hand-cable  
 Firing System Electrical or Manual

A



B



C



- A - Armor Piercing - Tracer  
 B - High Explosive - Incendiary  
 C - High Explosive - Incendiary

## AMMUNITION

Overall Length		7.6 inches
Case		Rimless
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black body, no fuze.	130
AP		
Tracer		
Incend.		
HE		
AP/T	Black body, white and green band	155.4
HE/I	Black body, red or yellow and red band	125
HE/AP		
HE/T	Black body, green, yellow and red band	134.2
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Barium Nitrate, Aluminum, and Magnesium	
HE	Black Powder or Cyclonite	
HE/I		

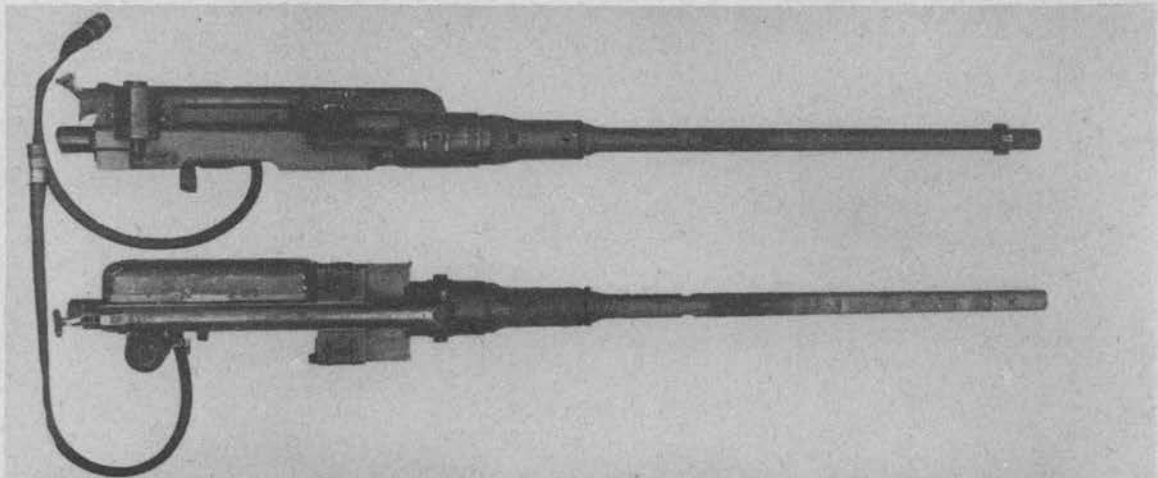
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DATE December 1944

## ARMAMENT

20 mm. MG 151/20 FIXED AIRCRAFT AUTOMATIC GUN (GERMAN) ARMY



## GENERAL

This weapon is of German manufacture and has been found only with German manufactured ammunition.

## PERFORMANCE

Rate of Fire (est.) 800 rounds per minute  
 Muzzle Velocity (est.) 2500 feet per second  
 Effective Range (est.) 800-1000 yards

## CHARACTERISTICS

Calibre .79 inches (20 mm)  
 Overall Length 69.5 inches  
 Weight of Gun 92 pounds  
 Type of Feed Disintegrating Metal Link Belt  
 Magazine Capacity -  
 Wt. Magazine Empty -  
 Wt. Magazine Full -  
 Wt. 100 Linked rds. 40 pounds  
 Charging System Electrical or Hand  
 Firing System Electrical

A



B



A - High Explosive

B - High Explosive - Incendiary

## AMMUNITION

Overall Length 5.75 inches  
 Case Rimless

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball		
AP	Black body, no fuze	115
Tracer		
Incend.		
HE	Yellow body, blue and red band	86.4
AP/T		
HE/I	Yellow body, green and red band	113
HE/AP	Black body, wide yellow band, no fuze	116
HE/T		
AP/I	Black body, blue band, no fuze	116

## EXPLOSIVE AND INCENDIARY COMPONENTS

TYPE	CONTENTS
Incend.	Sodium Sulphide, Ferric Oxide, Aluminum, Magnesium, and Zinc
HE	PETN
HE/I	

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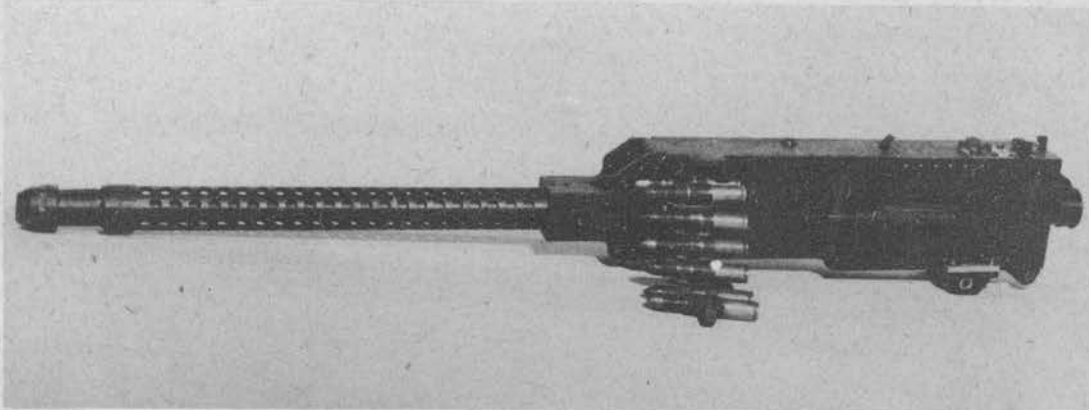
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## ARMAMENT

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20 mm. HO 5 FIXED AIRCRAFT AUTOMATIC GUN (BROWNING TYPE) - ARMY



## GENERAL

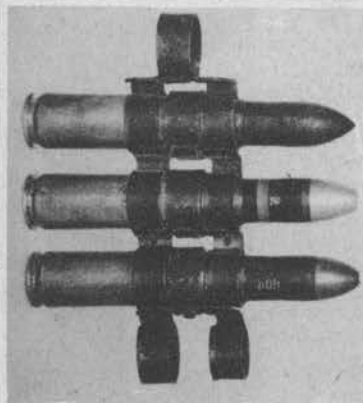
This gun is an enlarged model of the 12.7 mm Type 1 weapon. The operation is identical and the appearance is very similar. This is the first 20 mm gun capable of synchronized fire produced by the Japanese.

## PERFORMANCE

Rate of Fire (est.) 950 rounds per minute  
 Muzzle Velocity (est.) 2350 feet per second  
 Effective Range (est.) 1000 yards

## CHARACTERISTICS

Calibre .79 inches (20 mm)  
 Overall Length 58 inches  
 Weight of Gun 72 rounds  
 Type of Feed Disintegrating metal link belt  
 Magazine Capacity -  
 Wt. Magazine Empty -  
 Wt. Magazine Full -  
 Wt. 100 Linked rds. 49.4 rounds  
 Charging System Hydraulic  
 Firing System Electrical



AP/T

HE/I, Fuzed

HE/I, Fuzeless

## AMMUNITION

Overall Length 5.75 inches  
 Case Rimless

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball		
AP/T	Black body - plain or	Unknown
Tracer	Black body, green band or	"
Incend.	Black body, green and white bands	"
HE		
AP		
HE/I	Black body, red and yellow bands, aluminum fuze	Unknown
HE/AP	or	
HE/T	Black body - plain, brass nose cap	"
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

TYPE	CONTENTS
Incend.	Barium Nitrate, Aluminum, Magnesium
HE	PETN
HE/I	

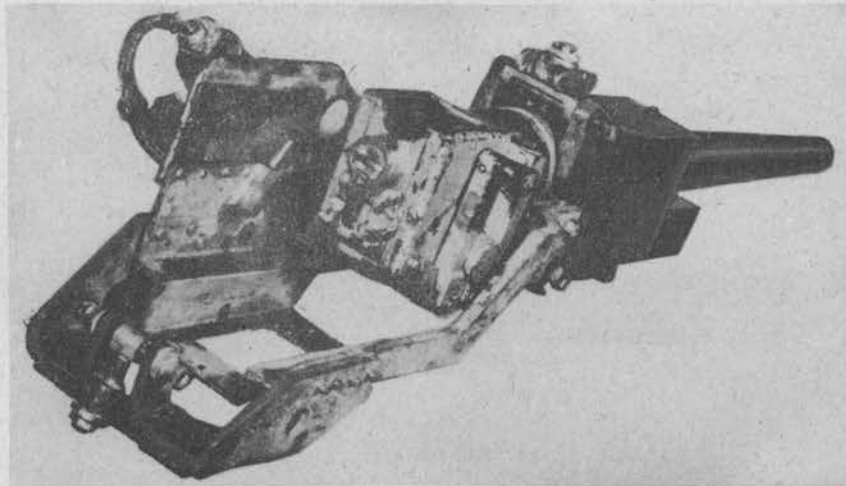
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## ARMAMENT

37 mm. TYPE 98 FIXED TANK CANNON (SINGLE SHOT) - ARMY



## GENERAL

This replica of the French 37 mm field gun has been found mounted in the tunnel of the Army fighter NICK. Later examinations of NICK reveal that this weapon has been replaced by a 37 mm Type Ho 203 which is fully automatic. The new cannon is believed to have a slow rate of fire and low muzzle velocity, with a magazine capacity of 18 or 25 rounds.

## PERFORMANCE

Rate of Fire (est.) 15-20 rounds per minute  
 Muzzle Velocity (est.) 2000 feet per second  
 Effective Range (est.) 1000 yards

## CHARACTERISTICS

Calibre 1.45 inches (37 mm)  
 Overall Length 54 inches  
 Weight of Gun 269 pounds  
 Type of Feed Hand fed

Magazine Capacity -  
 Wt. Magazine Empty -  
 Wt. Magazine Full -  
 Wt. 100 Linked rds -  
 Charging System -  
 Firing System Electrical



A 37 mm round with a nose fuze has also been used with this weapon. It is approximately 10.5 inches long.

## AMMUNITION

Overall Length 10 5/16 inches		PROJECTILE WT. (Grams)
Rimmed Case		
TYPE	COLOR CODE	
Ball	Black body, red, yellow and white or red and yellow bands	640.7
AP		
Tracer		
Incend.		
HE		
AP/T	Black body, red nose, white band	690.4
HE/I		
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.		
HE	TNT and Picric Acid	
HE/I		

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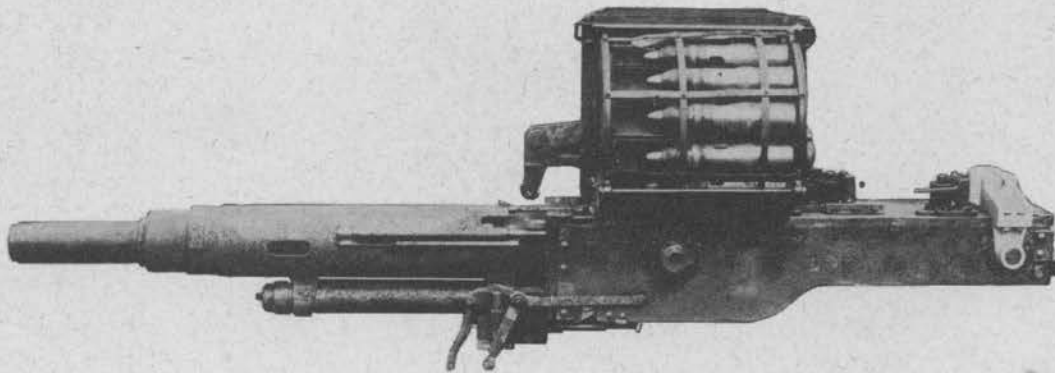
DATE March 1945



# ARMAMENT

# UNCLASSIFIED

37 mm. HO 203 FIXED AIRCRAFT AUTOMATIC CANNON - ARMY



## GENERAL

This cannon is a recoil operated weapon with a sliding breech block. A hydraulic cylinder under the barrel absorbs the recoil energy. The magazine is permanently attached to the receiver and contains an endless belt of clips which hold the ammunition. A complex feed mechanism moves the belt after each cycle and pushes a new cartridge into the breech. This cannon has been recovered only from the nose of NICK 1. Armor plate is mounted ahead and behind the magazine to protect the ammunition from gunfire.

## PERFORMANCE

Rate of Fire (est.) 300 rounds per minute  
Muzzle Velocity (est.) 2000 feet per second  
Effective Range (est.) 1000 yards

## CHARACTERISTICS

Calibre 1.45 inches (37 mm.)  
Overall Length 60.3 inches  
Weight of Gun 200 pounds (est.)  
Type of Feed Magazine

Magazine Capacity 25 rounds  
Wt. Magazine Empty -  
Wt. Magazine Full -  
Wt. 100 Linked rds. -  
Charging System Hydraulic  
Firing System Electrical



High Explosive-Incendiary Cartridge

The explosive in this cartridge is more powerful than is normally used in cannon ammunition. Japanese respect for it is indicated by their use of armor ahead and behind the magazine.

## AMMUNITION

Overall Length 7.75 inches  
Case Rimmed

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball		
AP		
Tracer		
Incend		
HE		
AP/T		
HE/I	Black body, yellow and red bands, brass fuze	436
HE/AP		
HE/T		
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

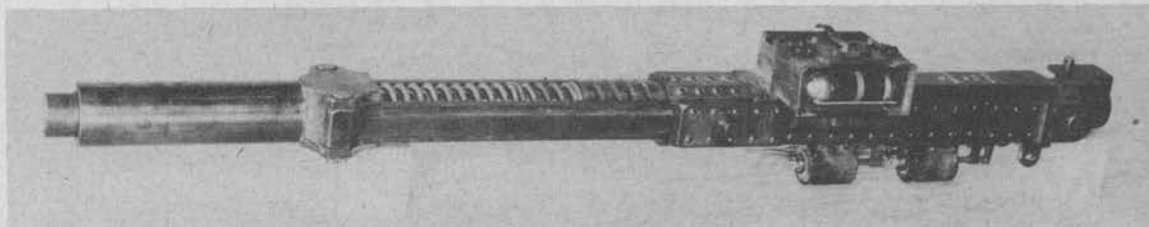
TYPE	CONTENTS
Incend.	Not yet analysed.
HE	BDX
HE/I	

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# UNCLASSIFIED

### 40 mm. HO 301 FIXED AIRCRAFT AUTOMATIC CANNON - ARMY



#### GENERAL

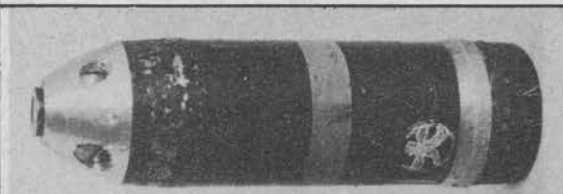
This cannon is a very light weapon for its caliber. The unusual type of ammunition permits simple construction and efficient operation. It operates on the blowback principle and is similar to the Oerlikon design thus far used only in Japanese Navy aircraft weapons. The wall thickness of the rifled barrel is uniform from muzzle to breech which is made possible by the low chamber pressure. This cannon has a very low muzzle velocity for an aircraft weapon and will be effective only at close ranges. It is charged manually, probably on the ground before takeoff. To date it has been installed only in the wings of TOJO.

#### PERFORMANCE

Rate of Fire (est.)	400 rds per min. (document)
Muzzle Velocity (est.)	760 ft. per sec. (tested)
Effective Range (est.)	150 yards (est.)

#### CHARACTERISTICS

Calibre	1.57 inches (40 mm.)
Overall Length	58.5 inches
Weight of Gun	110 pounds
Type of Feed	Magazine
Magazine Capacity	10 rounds (estimate)
Wt. Magazine Empty	Unknown
Wt. Magazine Full	Unknown
Wt. 100 Linked rds.	
Charging System	Manual
Firing System	Electrical



#### AMMUNITION

Overall Length	5.12 inches	
Case	None	
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
HE	Black body, yellow and red bands, aluminum fuse	568

The ammunition for this cannon is of a type not previously used in automatic weapons. The propelling charge is contained in a cavity in the rear of the projectile and no cartridge case is used. The charge appears to be the standard flake type smokeless powder used in small arms ammunition and is ignited by the usual type of primer. Twelve exhaust ports in the base plate permit the expanding gases to escape and drive the projectile forward. The copper rotating band acts as a gas seal.

This projectile is definitely not a rocket. The propellant is quick burning and burns completely before leaving the barrel.

#### EXPLOSIVE AND INCENDIARY COMPONENTS

TYPE	CONTENTS
Incend.	
HE	TNT
HE/I	

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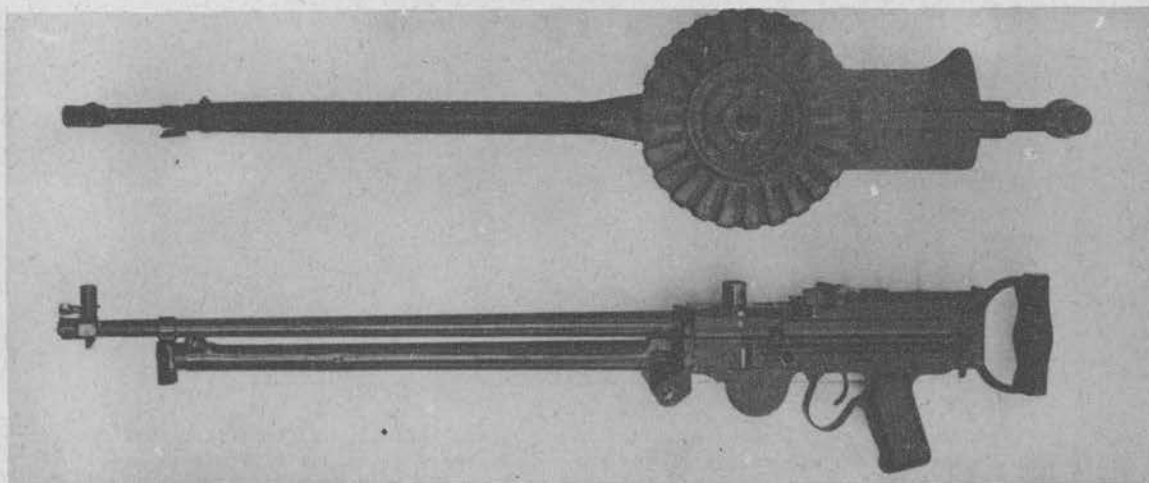
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# ARMAMENT

# UNCLASSIFIED

7.7 mm. TYPE 92 FLEXIBLE AIRCRAFT MACHINE GUN (LEWIS TYPE) - NAVY



## GENERAL

This is almost an exact copy of the British Lewis machine gun, and can fire the British .303 caliber ammunition.

## PERFORMANCE

Rate of Fire (est.) 600 rounds per minute  
Muzzle Velocity (est.) 2500 feet per second  
Effective Range (est.) 600 yards

## CHARACTERISTICS

Calibre .303 inches (7.7 mm)  
Overall Length 39 inches  
Weight of Gun 18.5 pounds  
Type of Feed Flat Drum Magazine  
Magazine Capacity (a) 47 rds. (b) 97 rds.  
Wt. Magazine Empty 3.75 lbs.  
Wt. Magazine Full 8.8 lbs.  
Wt. 100 Linked rds. -  
Charging System Hand  
Firing System Hand-trigger

A



B



A - Ball

B - Armor Piercing

The color marking is located on the base of the cartridge case.

## AMMUNITION

Overall Length 3.06 inches  
Case Rimmed

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black Ring	11.2
AP	White Ring	11.1
Tracer	Scarlet Ring	9.5
Incend.	Green Ring	9.6
HE		
AP/T		
HE/I	Dull Red Ring	9.8
HE/AP		
HE/T		
AP/I		

## EXPLOSIVE AND INCENDIARY COMPONENTS

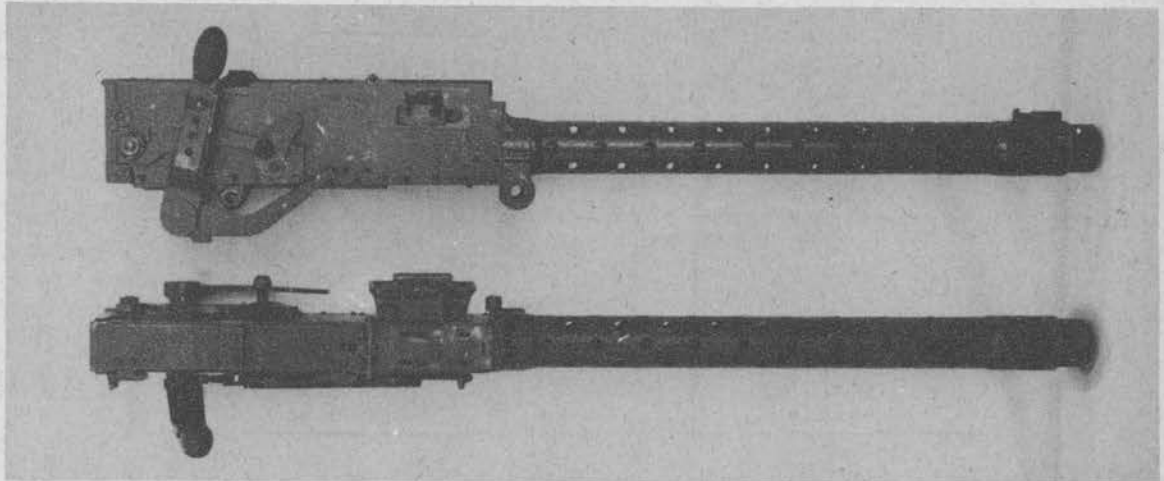
TYPE	CONTENTS
Incend.	Phosphorous
HE	50% PETN - 50% RDX
HE/I	Aluminum & TNT

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DATE March 1945

# UNCLASSIFIED

### 7.7 mm. TYPE 97 FIXED AIRCRAFT MACHINE GUN (VICKERS TYPE) - NAVY



#### GENERAL

Except for minor changes, this gun is the same as the British Vickers .303 caliber. It is very similar to the Type 89 machine gun used by the Japanese Army Air Forces, but cannot fire the Army ammunition.

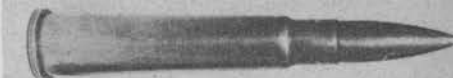
#### PERFORMANCE

Rate of Fire (est.) 850 rounds per minute  
Muzzle Velocity (est.) 2450 feet per second  
Effective Range (est.) 600 yards

#### CHARACTERISTICS

Calibre .303 inches (7.7 mm)  
Overall Length 41 inches  
Weight of Gun 27 pounds  
Type of Feed Disintegrating Metal Link Belt  
Magazine Capacity -  
Wt. Magazine Empty -  
Wt. Magazine Full -  
Wt. 100 Linked rds. 8 pounds  
Charging System Hand-lever or Cable  
Firing System Mechanical

A



B



A - Ball  
B - Armor Piercing

The color marking is located on the base of the cartridge case.

#### AMMUNITION

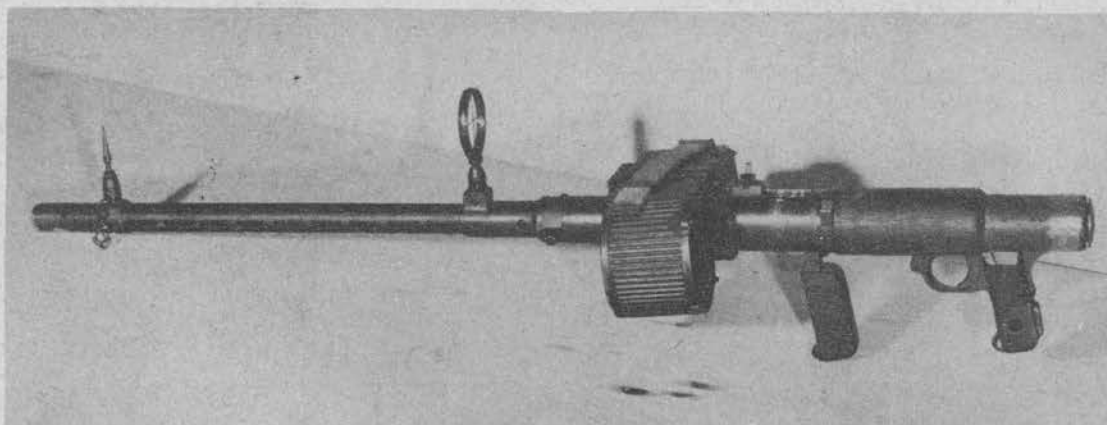
Overall Length Case		3.06 inches
		Rimmed
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black Ring	11.2
AP	White Ring	11.1
Tracer	Scarlet Ring	9.5
Incend.	Green Ring	9.6
HE		
AP/T		
HE/I	Dull Red Ring	9.2
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Phosphorous	
HE	50% PETN & 50% RDX	
HE/I	Aluminum and TNT	

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# ARMAMENT

7.92 mm. TYPE 1 FLEXIBLE AIRCRAFT MACHINE GUN (GERMAN MG 15 TYPE) - NAVY



## GENERAL

This weapon is almost identical with the Army 7.92 mm Type 98 gun with the exception of the second pistol grip and the wooden receiver extension. The exterior surfaces are rough but the internal parts are well finished.

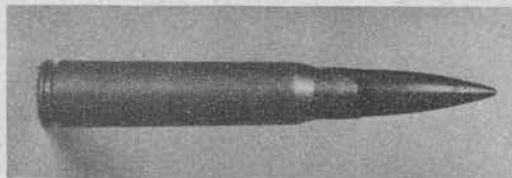
### PERFORMANCE

Rate of Fire (est.) 1000 rounds per minute  
Muzzle Velocity (est.) 2500 feet per second  
Effective Range (est.) 600 yards

### CHARACTERISTICS

Calibre .312 inches (7.92 mm)  
Overall Length 42.5 inches  
Weight of Gun 15.2 pounds  
Type of Feed Saddle type magazine

Magazine Capacity 75 rounds  
Wt. Magazine Empty 5.5 pounds  
Wt. Magazine Full 10.0 pounds  
Wt. 100 Linked rds. -  
Charging System Hand  
Firing System Hand Trigger



Standard Cartridge

Color marking appears around primer on base of cartridge.

Standard 7.92 mm Army ammunition has been recovered in this gun as well as two types of German manufactured cartridges.

### AMMUNITION

Overall Length	3.15 inches	
Case	Rimless	
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black Ring	Unknown
AP	White Ring	"
Tracer	Red Ring	"
Incend.	Green Ring	"
HE	Purple Ring	"
AP/T		
HE/I		
HE/AP		
HE/T		
AP/I		
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Phosphorous	
HE	PETN & RDX	
HE/I		

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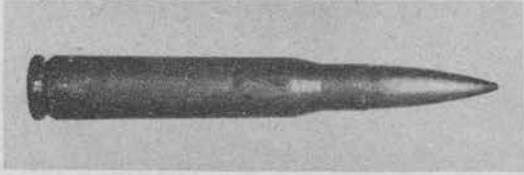
# UNCLASSIFIED ARMAMENT

## 13.2 mm. TYPE 3 FIXED AND FLEXIBLE AIRCRAFT MACHINE GUN (BROWNING TYPE) - NAVY



### GENERAL

This gun resembles the U.S. Cal. .50 Browning very closely. The main differences are the use of a bolt latch for firing; substitution of springs for the fiber discs in the back plate buffer assembly, and the addition of a flash hider.

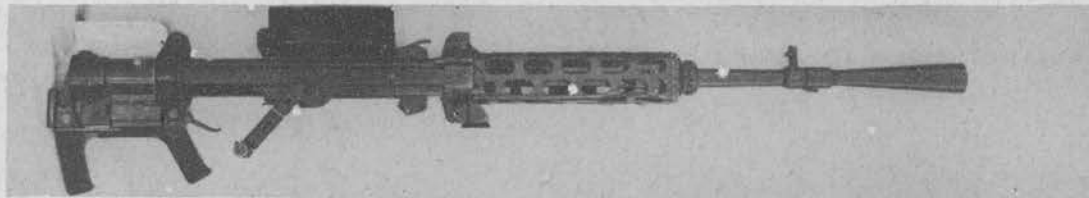
PERFORMANCE		AMMUNITION		
Rate of Fire (est.)	800 rounds per minute	Overall Length	5.38 inches	
Muzzle Velocity (est.)	2620 feet per second	Case	Rimless	
Effective Range (est.)	900 yards			
CHARACTERISTICS		TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Calibre	.518 inches (13.2 mm)	Ball	Black Ring	Unknown
Overall Length	61 inches	AP	White Ring	"
Weight of Gun	61.6 pounds	Tracer	Red Ring	"
Type of Feed	Disintegrating metal link belt	Incend.	Green Ring	"
Magazine Capacity	-	HE		
Wt. Magazine Empty	-	AP/T		
Wt. Magazine Full	-	HE/I	Purple Ring	"
Wt. 100 Linked rds.	30.6 pounds	HE/AP		
Charging System	Manual or Hydraulic	HE/T		
Firing System	Electrical	AP/I		
 <p>Appearance of standard types of ammunition. Incendiary type has flat nose.</p> <p>Color marking appears on base of shell around primer.</p>		EXPLOSIVE AND INCENDIARY COMPONENTS		
		TYPE	CONTENTS	
		Incend.	Phosphorous	
		HE		
		HE/I	RDX and Aluminum Powder	



# ARMAMENT

# UNCLASSIFIED

20 mm. TYPE 99 MK I FLEXIBLE AIRCRAFT AUTOMATIC GUN (OERLIKON TYPE) - NAVY



20 mm. TYPE 99 MK I FIXED AIRCRAFT AUTOMATIC GUN (OERLIKON TYPE) - NAVY



Type 99 Mark 1 Model 4



## GENERAL

This is an extremely light weapon for its caliber. The different models of the Mark 1 version of this gun fire the same ammunition. The Mark 2 version (shown on the next page) is a larger weapon designed to use ammunition with the same projectile but with a greater amount of propellant.

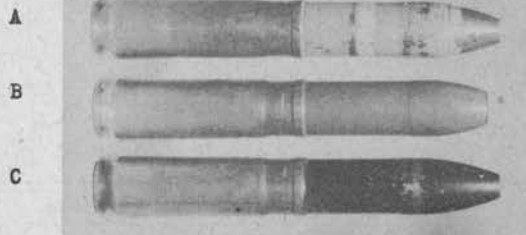
## PERFORMANCE

Rate of Fire (est.) 500 rounds per minute  
Muzzle Velocity (est.) 2000 feet per second  
Effective Range (est.) 800 yards

## CHARACTERISTICS

Calibre .79 inches (20 mm)  
Overall Length Fixed-53" Flexible-62"  
Weight of Gun Fixed-47# Flexible-64.5#  
Type of Feed French Drum Magazine

Magazine Capacity (a) 60 rds. (b) 100 rds.  
Wt. Magazine Empty 19 lbs. 23 lbs.  
Wt. Magazine Full 45 lbs. 67 lbs.  
Wt. 100 Linked rds. -  
Charging System Pneumatic or manual  
Firing System Pneumatic or manual



- A - High Explosive-incendiary  
B - Tracer  
C - Ball

## AMMUNITION

Overall Length 5.22 to 5.68 inches  
Case Oerlikon Type

TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black body, flat tip, no fuze	126
AP	Black body, painted tip, no fuze	131.7
Tracer	Red or green body, no fuze	
Incend.		
HE	Dark brown, black or orange-yellow body - with or without white bands	129
AP/T		
HE/I	Greenish yellow body, with or without white bands	
HE/AP		
HE/T	Red body, with or without white bands	
AP/I	White body, no fuze	

## EXPLOSIVE AND INCENDIARY COMPONENTS

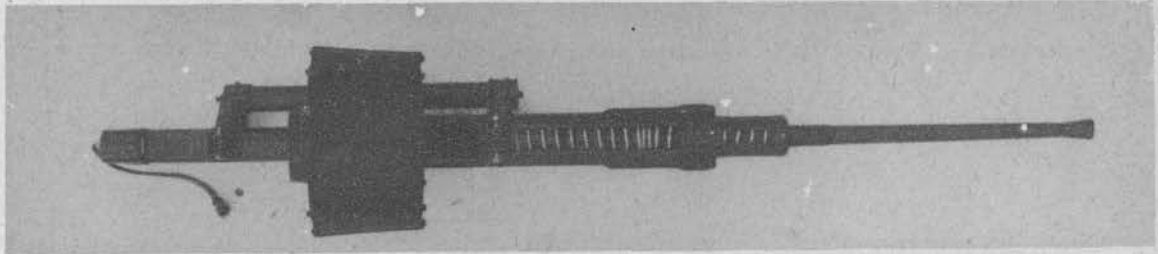
TYPE	CONTENTS
Incend.	White Phosphorus
HE	TNT
HE/I	Aluminum, Potassium nitrate, Nitro-cellulose

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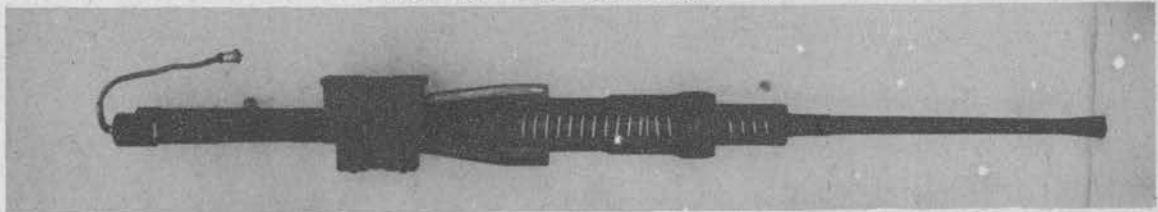
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### 20 mm. TYPE 99 MK 2 FIXED AIRCRAFT AUTOMATIC GUN (OERLIKON TYPE) - NAVY





Type 99 Mark 2 Model 4 (Belt Fed)



#### GENERAL

In order to increase the muzzle velocity, this weapon was developed from the Type 99 Mark 1. The ammunition used contains the same projectile but a greater amount of propellant charge. The overall length has been increased approximately nineteen inches.

PERFORMANCE		AMMUNITION		
Rate of Fire (est.)	500 rounds per minute	Overall Length	6.75 inches	
Muzzle Velocity (est.)	2500-2700 feet per second	Case	Oerlikon Type	
Effective Range (est.)	1000 yards			
CHARACTERISTICS		TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Calibre	.79 inches (20 mm)	Ball	Black body, flat tip, no fuze	126
Overall Length	72 inches	AP	Black body, pointed tip, no fuze	131.7
Weight of Gun	75 pounds	Tracer	Red or green body, no fuze	
Type of Feed	Mod 3 - French Drum Magazine Mod 4 - Belt fed	Incend.		
Magazine Capacity	100 rounds	HE	Dark brown, black or orange-yellow body - with or without white bands	129
Wt. Magazine Empty	40 lbs.	AP/T		
Wt. Magazine Full	90 lbs.	HE/I	Greenish yellow body, with or without white bands	
Wt. 100 Linked rds.		HE/AP		
Charging System	Pneumatic or manual	HE/T	Red body, with or without white bands	
Firing System	Pneumatic, manual, or electrical	AP/I	White body, no fuze	
<div>A</div>  <div>B</div>  <p>A - Armor Piercing B - High Explosive</p> <p>The same projectile is used in both Mark 1 and Mark 2 cartridges.</p>		EXPLOSIVE AND INCENDIARY COMPONENTS		
		TYPE	CONTENTS	
		Incend.		
		HE		
		HE/I		

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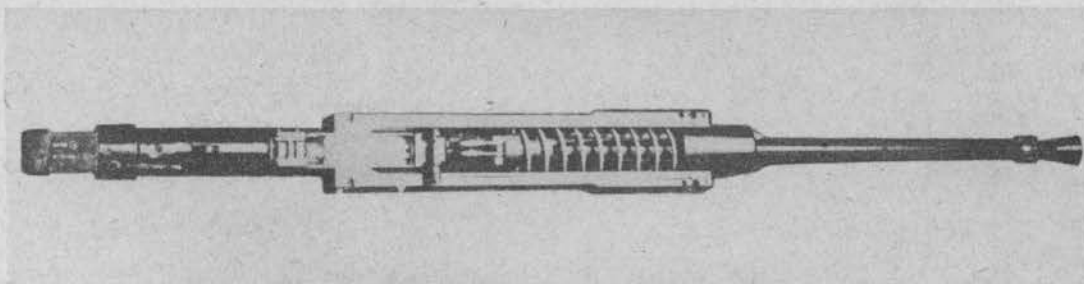
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# ARMAMENT

UNCLASSIFIED

## 30 mm. TYPE 2 FIXED AIRCRAFT AUTOMATIC GUN (OERLIKON TYPE) - NAVY



### GENERAL

This gun has not yet been recovered but documents indicate that it is in production. Ammunition for it has been recovered in the field. In general its construction is very similar to the 20 mm Type 99 Gun.

#### PERFORMANCE

Rate of Fire (est.) 400 rounds per minute  
Muzzle Velocity (est.) 2300 feet per second  
Effective Range (est.) 1000 yards

#### CHARACTERISTICS

Calibre 1.179 inches (30 mm)  
Overall Length 82.5 inches  
Weight of Gun 112 pounds  
Type of Feed Magazine  
Magazine Capacity 42 rounds  
Wt. Magazine Empty Unknown  
Wt. Magazine Full 84.2 pounds  
Wt. 100 Linked rds. -  
Charging System Manual  
Firing System Electrical



Incendiary Cartridge

Other types of ammunition have same outline as shown above. White bands may appear around projectile indicating modification.

#### AMMUNITION

Overall Length 6.56 inches		
Case Oerlikon Type		
TYPE	COLOR CODE	PROJECTILE WT. (Grams)
Ball	Black body, no fuze	Unknown
AP		
Tracer	Black body, red tip, no fuze	"
Incend.	Greenish yellow body, aluminum fuze	"
HE	Rust brown body, aluminum fuze	"
AP/T		
HE/I		
HE/AP		
HE/T	Red body, aluminum fuze	"
AP/I	White body, no fuze	"
EXPLOSIVE AND INCENDIARY COMPONENTS		
TYPE	CONTENTS	
Incend.	Phosphorous	
HE	50/50 PETN and TNT	
HE/I		

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# RADIO

# UNCLASSIFIED RADIO

The majority of Japanese airborne sets have been well constructed and of orthodox design although they have lagged behind the Allies in technique. Naval equipment accepted since 1943 is comparable with equivalent Allied sets and appears to be of original design. Variations in circuit, tube combinations and layout may occur with or without any indication in the set nomenclature, and model numbers have not been included where only minor variations are known to have occurred.

## NAVY

### EQUIPMENT

Type 96 Ku 1  
Type 96 Ku 2  
  
Type 96 Ku 3  
  
Type 96 Ku 4  
Type 98 Ku 3  
Type 98 Ku 4  
Type 1 Ku 3  
  
Type 1 Ku 3 Model 1  
Type 2 Ku 3  
  
Type 3 Ku 1  
  
Type 3 Ku 5  
Type 0 Ku 4 (RDF)  
Type 1 Ku 3 (RDF)

### AIRCRAFT

ZEKE  
GLEN-SLIM-SEIRAN (M6A1)--DINAH-JUDY-  
VAL-"Fighter-Bomber"  
NORA-PAUL-PETE-TOKAI (Q1W1)-BETTY-  
JAKE-VAL  
BETTY- NELL  
BETTY  
BETTY-NELL-EMILY-MAVIS  
KATE-JILL-FRANCES-PAUL-GLEN-JAKE-  
SLIM-SEIRAN (M6A1)-ZEKE-VAL-JUDY  
IRVING-JAKE  
PAUL-JAKE-KATE-JILL-FRANCES-BETTY-  
NELL-EMILY-MAVIS  
JUDY-RUTE-REX-ZEKE-JACK-GEORGE-  
BETTY-LIZ  
  
EMILY-MAVIS-BETTY-NELL  
ZEKE-KATE-VAL-JAKE-BABS-JUDY-FRANCES-  
JILL-PAUL-GLEN-SLIM-SEIRAN (M6A1)-JACK-  
GEORGE

## ARMY

Type 94 H1 2  
Type 96 H1 2  
Type 99 H1 1  
Type 99 H1 2  
Type 99 H1 3  
Type 99 H1 4  
H1 Model 2 (RDF)  
H1 2 (RDF)  
Type 4 H1 3 Model 1

SALLY  
DINAH-LILY-HELEN  
DINAH-SALLY-HELEN  
DINAH-LILY  
TONY-TOJO-OSCAR-SONIA-DINAH-FRANK  
SALLY-LILY-HELEN  
SALLY-LILY-HELEN  
DINAH  
FRANK

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DATE March 1945

# UNCLASSIFIED

951

**RADIO**

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**DATE** March 1945

UNCLASSIFIED 952

## RADIO

## RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Type 94 Hi 2	Type 96 Hi 2	Type 96 Hi 3 Mod 2	Type 99 Hi 1 and Hi 1
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	1.4-7.9	0.2-0.5 1.5-7.5	Rcvr 2? Trans. 5?	2.5-18.0
Transmitter Circuit	Crystal or Self Excited	Crystal	Crystal	Crystal or Self Excited
Power Output	15-20 Watts	8-10 Watts	3 Watts ?	30 Watts
Transmitter Tuning	3 Controls	4 Controls	1 Control ?	3 Controls
Type of Emission	CW, MCW, and Phone	CW, MCW, and Phone	Phone	CW, MCW, and Phone
Antenna	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft?	Fixed Aircraft
Receiver Circuit	Superheterodyne	Superheterodyne	TRF Reflex	Superheterodyne
Sensitivity				
Selectivity				
Receiver Tuning	1 Control	2 Controls		1 Control 3 Switches
Tubes Used	(3) UX865 (1) UZ77 (1) UT6A7 (1) UZ78 (1) UZ37 (1) UZ41	(3) UZ510 (1) UY76 (1) UY133A (1) UX109 (1) UZ135	(1) UY76 (1) 6B7 (1) UZ41 (2) UZ6D6 (2) UY76 (1) UT6L7 (1) UT6B7	(3) UX807A (6) UT6F7
Trans. and Rec. Size (Inches)		17 x 13 x 11		
Overall Weight (Lbs.)	36	82 (complete)		74 (complete)
Power Source	2 Dynamotors	1 Dynamotor	Vibrator	2 Dynamotors
<b>TACTICAL DATA</b>				
Use in Aircraft	Command	Command	Liaison	Command
Range (Mi. & Alt. in ft.)				
REMARKS	Obsolete	Obsolescent	Obsolete	

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# RADIO

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RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Type 99 H1 2 and H1 2	Type 99 H1 3 and H1 3	Type 99 H1 4 and H1 4	Type 4 H1 3 Mod 1
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	1.5-15	Rcvr 1.5-6.7 Trans. 2.5-5.0	44.0-50.0	4.0-6.0
Transmitter Circuit	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator
Power Output	18 Watts	8 Watts Phone 15 Watts C.W.	12 Watts	8 Watts
Transmitter Tuning	5 Controls 1 Switch	2 Controls	3 Controls	2 Controls
Type of Emission	CW, MCW, and Phone	CW, MCW, and Phone	Phone	CW
Antenna	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft
Receiver Circuit	Superheterodyne	Superheterodyne	Superheterodyne	Superheterodyne
Sensitivity			4.6 Microvolts	
Selectivity			20 KC at -60B	
Receiver Tuning	2 Controls	3 Controls	4 Controls	1 Control
Tubes Used	(2) UX807A (5) UT6F7	(2) UX807A (4) UT6F7	(3) UX807A (4) UT6F7	(3) UX807A (5) UT6F7
Trans. and Rec. Size (Inches)		Rcvr 8 x 7 x 5½ Trans 6 x 7 x 8	15 x 7½ x 8½	
Overall Weight (Lbs.)	42 (complete)	55 (complete)	46 (complete)	
Power Source	1 Dynamotor	1 Dynamotor	1 Dynamotor	
<b>TACTICAL DATA</b>				
Use in Aircraft	Command	Command Liaison	Liaison	Command Liaison
Range (Mi. & Alt. in ft.)		70 @ 10,000	80 @ 10,000	
REMARKS		Separate Units for Fighter Use. Model 2 Receiver 4.0-6.0 mc/s (5) 6F7		

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## RADIO

## RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Hi 1 Mod. 2 Radio Homing and Direction Finder	Hi 2 Radio Homing and Direction Finder		
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	0.160-0.385	0.16-1.20 (approx.)		
Transmitter Circuit				
Power Output				
Transmitter Tuning				
Type of Emission				
Antenna	Single Loop			
Receiver Circuit				
Sensitivity				
Selectivity				
Receiver Tuning	3 Remote Controls			
Tubes Used	(5) UY76 (4) UZ6D6 (1) UZ6L7G			
Trans. and Rec. Size (Inches)	17½ x 7 x 9½			
Overall Weight (Lbs.)	24			
Power Source	2 Dynamotors			
<b>TACTICAL DATA</b>				
Use in Aircraft	Direction Finding			
Range (Mi. & Alt. in ft.)				
REMARKS	Similar to German Telefunken Type EZ-2	Believed to be smaller version of Hi 1 Mod. 2		

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**RADIO****RADIO EQUIPMENT—JAPANESE AIRCRAFT**

	JAPANESE SET DESIGNATION			
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)				
Transmitter Circuit				
Power Output				
Transmitter Tuning				
Type of Emission				
Antenna				
Receiver Circuit				
Sensitivity				
Selectivity				
Receiver Tuning				
Tubes Used				
Trans. and Rec. Size (Inches)				
Overall Weight (Lbs.)				
Power Source				
<b>TACTICAL DATA</b>				
Use in Aircraft				
Range (Mi. & Alt. in ft.)				
<b>REMARKS</b>				

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956  
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**RADIO**

### RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Type 99 Flying Mark 1	Type 99 Flying Mark 2	Type 99 Flying Mark 3	Type 99 Flying Mark 4
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	2.5-18.0	1.5-15.0	1.5-6.7 (Rec.) 2.5-5.0 (Trans.)	44.0-50.0
Transmitter Circuit	Crystal or Self Excited	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator
Power Output	30 Watts (approx)	18 Watts (approx)	4 Watts Phone 5 Watts CW	12 Watts
Transmitter Tuning	3 Controls		2 Controls	3 Controls
Type of Emission	CW, MCW, and Phone	CW, MCW, and Phone	CW, MCW, and Phone	Phone
Antenna	Fixed Aircraft Type	Fixed Aircraft Type	Fixed Aircraft Type	Fixed Aircraft Type
Receiver Circuit	Superheterodyne	Superheterodyne	Superheterodyne	Superheterodyne
Sensitivity			4.6 Microvolts	
Selectivity			20 kc at 6 db down	
Receiver Tuning	1 Knob, 3 Switches		3 Controls	4 Controls
Tubes Used	(3) UX807A (6) UT6F7	(2) UX807A (5) UT6F7	(2) UX807A (4) UT6F7	(3) UX807A (4) UT6F7
Trans. and Rec. Size (Inches)	Trans. & Rec. are the same size.		Rec. 8 x 7 x 5-3/8 Trans. 5-3/4 x 7 x 7-3/4	15 x 7-3/4 x 8-5/8
Overall Weight (Lbs.)	Rec.-11, Trans.-14 Complete-74	Rec.-9, Trans.-13 Complete-42	Complete-55	25 - Trans. & Rec. 19 1/2 - Power Unit
Power Source	2 Dynamotors	1 Dynamotor	1 Dynamotor	1 Dynamotor
<b>TACTICAL DATA</b>				
Use in Aircraft	Air-Ground Liaison	Air-Ground Liaison	Command Set	Air-Ground Liaison
Range (Mi. & Alt. in ft.)			70 @ 10,000	80 @ 10,000
REMARKS	Separate dynamotors are used for the Rec. and Trans., connected to units by a junction box.	One dynamotor with input regulator used. No remote control arrangement	A Control box, an- tenna loading coil and voltage regula- tor make up a com- plete set.	From data known, this gear appears to be of good con- struction and elec- trical design.

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# RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	H1 1 Type 99 Radio Set. (Modified Type 99 Flying Mark 1)	H1 2 Type 99 Radio Set. (Modified Type 99 Flying Mark 2)	H1 3 Type 99 Radio Set. (Modified Type 99 Flying Mark 3)	H1 4 Type 99 Radio Set. (Modified Type 99 Flying Mark 4)
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	5.0-7.5 (approx.)	1.5-15.0	2.5-7.3 (Trans.) 1.5-6.7 (Rece.)	44.0-50.0
Transmitter Circuit		Crystal Oscillator	Crystal Oscillator	
Power Output	15-20 Watts	5 Watts Phone	4 Watts Phone 5 Watts CW	20 Watts (approx.)
Transmitter Tuning		1 Control 2 Switches	2 Controls	
Type of Emission		CW, MCW, and Phone	CW, MCW, and Phone	
Antenna		Fixed Aircraft Type	Fixed Aircraft Type	Fixed Aircraft Type
Receiver Circuit		Superheterodyne (Uses plug in Coils)	Superheterodyne	
Sensitivity				
Selectivity				
Receiver Tuning		1 Control	3 Controls	
Tubes Used	Trans.-(3) UX807A Rec. - ?	Trans.-(2) UX807A Rec. -(5) UT6F7	Trans.-(2) UX807A Rec. -(4) UT6F7 (Also 5 tube Model)	Trans.-(3) UX807A Rec. -(4) UT6F7
Trans. and Rec. Size (Inches)		13-3/8x8-5/8x7-3/4 (Both in one Case)	Each Unit 5 1/2 x 7 1/2 x 8 1/2	
Overall Weight (Lbs.)		24	Each Unit - 10 1/2	
Power Source		1 Dynamotor	1 Dynamotor	
<b>TACTICAL DATA</b>				
Use in Aircraft		Air-Ground Liaison and Command.	Air-Ground Liaison	
Range (Mi. & Alt. in ft.)				
REMARKS		Neatly & Compactly built. Moisture proofing has been attempted by spraying components with a clear substance.	This set is very compact and well constructed.	

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# RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Type 1 Aero Mark 3	Type 2 Aero Mark 3	Type 3 Aero Mark 1	
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	30.0-45.0	0.3-0.5, 2.5-5.0 5.0-10.0, 10.0-20.0	5.0-10.0	
Transmitter Circuit	Crystal Oscillator	Crystal or Self Excited	Crystal or Self Excited	
Power Output	5 Watts	200 Watts CW 60 Watts Phone	75 Watts CW 25 Watts Phone	
Transmitter Tuning	2 Controls	4 Controls	2 Controls	
Type of Emission	MCW and Phone	CW, MCW, and Phone	CW, MCW, and Phone	
Antenna	Fixed Aircraft Type	Fixed Aircraft Type	Fixed Aircraft Type	
Receiver Circuit	Superheterodyne	Superheterodyne	Superheterodyne	
Sensitivity			0.8-3.8 Microvolts	
Selectivity			20.8 Kc at 6 db down for CW.	
Receiver Tuning	1 Control	5 Controls	1 Control	
Tubes Used	(4) 6V6, (2) 6K7 (2) 6J7, Other Models use other Types.		Trans.-(1) 6B325A (1) 6Z064A Rec.- 6M2A05A (10)	
Trans. and Rec. Size (Inches)	14-1/8 x 6 x 6 (Both in one case)		17 1/2 x 8 1/2 x 7-3/4	
Overall Weight (Lbs.)	25	RF Unit - 100	70	
Power Source	Vibrator		2 Dynamotors	
<b>TACTICAL DATA</b>				
Use in Aircraft	Command Set	Command and Liaison Set	Air-Ground Liaison and Command Set.	
Range (Mi. & Alt. in ft.)	50 @ 10,000		100 @ 10,000	
REMARKS	Well constructed very compact, but no evidence of weather or fungus protection.	Variometer tuning in the high freq. trans. circuit. Identical tubes used in the Rec.	Excellent mechan- ical and electrical design. No weather proofing or fungus protection.	

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# RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Flying Mark 1 Radio Homing and Direction Finder	Flying Mark 2 Radio Homing and Direction Finder	Type O Aero Mark 4 Radio Homing and Direction Finder	Type 1 Aero Mark 3 Radio Homing and Direction Finder
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	0.160-0.385	0.16-1.20 (approx.)	0.165-1.200	0.17-0.46 0.45-1.20
Transmitter Circuit	None	None	None	None
Power Output				
Transmitter Tuning				
Type of Emission				
Antenna	Single Loop		Single Loop - 42 Cm Diameter	Single Rotatable Loop
Receiver Circuit			Heterodyne	Superheterodyne
Sensitivity				
Selectivity				
Receiver Tuning	3 Remote Controls			2 Remote Controls
Tubes Used	(5) UY76, (4) UZ6D6 (1) UZ6L7G		6 Tubes	(1) 6P7G, (3) 6V6 (2) 6J7, (4) 6K7 (1) 6B8, (1) 6L7 (1) 6J5, (1) 6Q7
Trans. and Rec. Size (Inches)	17-3/4 x 7 x 9-3/4		Different Models use different sizes	18 x 9 1/2 x 6 1/2
Overall Weight (Lbs.)	24			15
Power Source	2 Dynamotors			1 Dynamotor
<b>TACTICAL DATA</b>				
Use in Aircraft	Direction Finding and Homing	Direction Finding and Homing	Direction Finding and Homing	Direction Finding and Homing
Range (Mi. & Alt. in ft.)				
<b>REMARKS</b>	Similar to German Telefunken Equip- ment EZ-2. Two sizes may be found	Not much data is available on this equipment.	May or may not be equipped with a com- pass. Course indi- cator is a zero cen- ter DC type Ammeter.	Identical with U.S. Fairchild set. May be used to rendez- vous fighters with enemy planes.

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# RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

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	JAPANESE SET DESIGNATION			
	Type 96 Ku 1	Type 96 Ku 2	Type 96 Ku 3	Type 96 Ku 4
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	3.8-5.8	.3-.5 1.7-3.5 5.0-10.0	0.2-0.5 4.5-11.2	0.3-15.0
Transmitter Circuit	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator
Power Output	8-10 Watts	27 Watts CW 9 Watts Phone	75 Watts (High) 8 Watts (Low)	175 Watts CW (approx.)
Transmitter Tuning	1 Control	2 Controls	3 Controls	
Type of Emission	CW and Phone	CW, MCW and Phone	CW	CW and Phone
Antenna	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft
Receiver Circuit	Superheterodyne	Superheterodyne	Superheterodyne	Superheterodyne HF TRF LF
Sensitivity		13 Microvolts	3.5-1300 Micro- volts	
Selectivity		19 KC @ -6DB	2-10 KC @ -6DB	
Receiver Tuning	2 Controls	4 Controls	2 Controls	
Tubes Used	(2) UX47Z (2) UX134 (1) UY133A (1) UZ135 (1) UX109	(3) UZ510 (2) UZ66 (1) UT6L7G (3) UY76 (1) UT76 (1) UT6B7 (1) UZ41	(1) UZ816 (1) UX865 (1) UX47A (2) UY36A (5) UY37A (1) UY39A	(1) UX47C (1) UY816D (2) UY36A (4) UY37A (1) UY39A
Trans. and Rec. Size (Inches)	Each Unit 9½ x 8 x 5½	17 x 13 x 10½	Trans. 18½ x 14 x 10 Rcvr. 14 x 10 x 7½	
Overall Weight (Lbs.)	38 (complete)	48 (complete)	40	98 (complete)
Power Source	1 Dynamotor	1 Dynamotor	1 Dynamotor & Vibrapack	1 Dynamotor & Vibrapack
<b>TACTICAL DATA</b>				
Use in Aircraft	Command	Command	Command Liaison	Command
Range (Mi. & Alt. in ft.)	50 @ 10,000	200 @ 10,000	50 @ 10,000 (Low) 200 @ 10,000 (High)	200 @ 10,000
REMARKS		Model 1 has 8 crystal holders and receiver tube types (8) FM2A05A		

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# RADIO

# RADIO

## RADIO EQUIPMENT—JAPANESE AIRCRAFT

	JAPANESE SET DESIGNATION			
	Type 98 Ku 3	Type 98 Ku 4	Type 1 Ku 3	Type 2 Ku 3
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	30.0-50.0	29.5-52.5	30.0-45.0	0.3-20.0
Transmitter Circuit	Crystal Oscillator	Crystal Oscillator	Crystal Oscillator	Crystal or S.E. Oscillator
Power Output	3 Watts Phone	12 Watts Phone	5 Watts Phone	60 Watts Phone 200 Watts C.W.
Transmitter Tuning		2 Controls 1 Switch	2 Controls	4 Controls
Type of Emission	MCW and Phone	MCW and Phone	CW and Phone	CW, MCW and Phone
Antenna	3/4 Wave	Fixed Aircraft	Fixed Aircraft	Fixed Aircraft
Receiver Circuit		Superheterodyne	Superheterodyne	Superheterodyne
Sensitivity			4 Microvolts	2 Microvolts
Selectivity			8 KC @ -6DB	4 KC @ -6DB
Receiver Tuning		2 Controls 1 Switch	1 Control	5 Controls
Tubes Used	Trans. (4) † Rcvr. (7) †	(3)UX807 (1)6K7 (1)6A8 (1)6J7 (1)6B8 (1)6V6 (1)6K8	(4)6V6 (2)6K7 (2)6J7	(1)FB325A (1)FZ064A (10)FM2A05A
Trans. and Rec. Size (Inches)		16 x 8 x 11	14 x 6 x 6	21 x 15 x 12
Overall Weight (Lbs.)	20	30	25	. 75 (complete)
Power Source		1 Dynamotor	1 Vibrator	1 Dynamotor
<b>TACTICAL DATA</b>				
Use in Aircraft	Liaison	Liaison	Liaison	Liaison Command
Range (Mi. & Alt. in ft.)	20 @ 10,000	75 @ 10,000	50 @ 10,000	
<b>REMARKS</b>	Documentary evidence only	Output frequency 8th harmonic of crystal	Tube Types vary with model	

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**RADIO****RADIO****RADIO EQUIPMENT—JAPANESE AIRCRAFT**

	JAPANESE SET DESIGNATION			
	Type 3 Ku 1	Type 3 Ku 5	Type 0 Ku 4 Direction Finding	Type 1 Ku 3 Direction Finding
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)	5.0-10.0	Trans. 2.5-20.0 Rcvr. 0.3-20.0	0.165-1.2	0.17-1.2
Transmitter Circuit	Crystal or Self Excited	Crystal or Self Excited		
Power Output	75 Watts CW 25 Watts Phone	75 Watts		
Transmitter Tuning	2 Controls	4 Controls (each channel)		
Type of Emission	CW, MCW and Phone	CW and Phone		
Antenna	Fixed Aircraft	Fixed Aircraft (separate channels)	Loop	Loop
Receiver Circuit	Superheterodyne	Superheterodyne	Superheterodyne	Superheterodyne
Sensitivity	0.8-3.8 Micro- volts	2 Microvolts		
Selectivity	20.8 KC @ -6DB	4 KC @ -6DB		
Receiver Tuning	1 Control	4 Controls		2 Remote Controls
Tubes Used *	Trans. (1)FB325A (1)F2064A Rcvr. FM2A05A (10)	(4)FC064A (3)FB325A (10)FM2A05A	6 Tubes ?	(1)6P7G (3)6V6 (3)6J7 (4)6K7 (1)6B8 (1)6L7 (1)6J5 (1)6Q7
Trans. and Rec. Size (Inches)	17 x 8 x 8	Trans. 27 x 21 x 15 Rcvr. 15 x 12 x 12	Size varies with model number	18 x 9 x 6
Overall Weight (Lbs.)	70 (complete)	150 (complete)		15
Power Source	2 Dynamotors	1 Dynamotor (built in)		1 Dynamotor
<b>TACTICAL DATA</b>				
Use in Aircraft	Command Liaison	Command	Direction Finding	Direction Finding
Range (Mi. & Alt. in ft.)	100 @ 10,000	200 @ 10,000		
REMARKS	Excellent design, no moisture proof- ing	3 Channel Set		Identical with U.S. Fairchild Set

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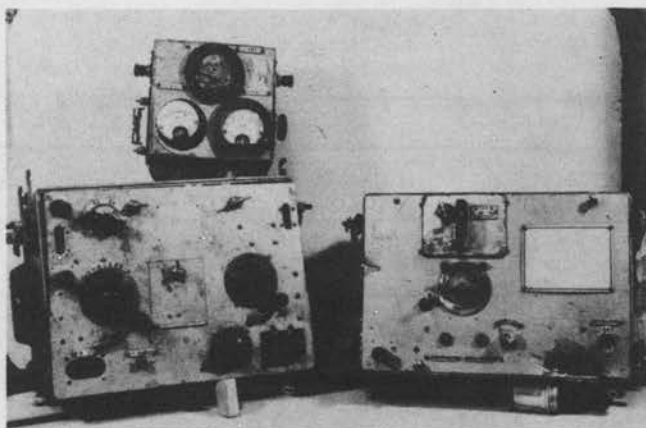
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**RADIO****RADIO EQUIPMENT—JAPANESE AIRCRAFT****UNCLASSIFIED**

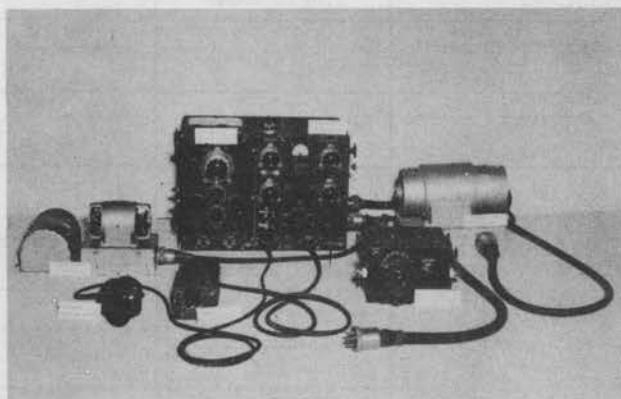
	JAPANESE SET DESIGNATION			
<b>TECHNICAL DATA</b>				
Frequency Range (Megacycles)				
Transmitter Circuit				
Power Output				
Transmitter Tuning				
Type of Emission				
Antenna				
Receiver Circuit				
Sensitivity				
Selectivity				
Receiver Tuning				
Tubes. Used				
Trans. and Rec. Size (Inches)				
Overall Weight (Lbs.)				
Power Source				
<b>TACTICAL DATA</b>				
Use in Aircraft				
Range (Mi. & Alt. in ft.)				
<b>REMARKS</b>				

DATE March 1945

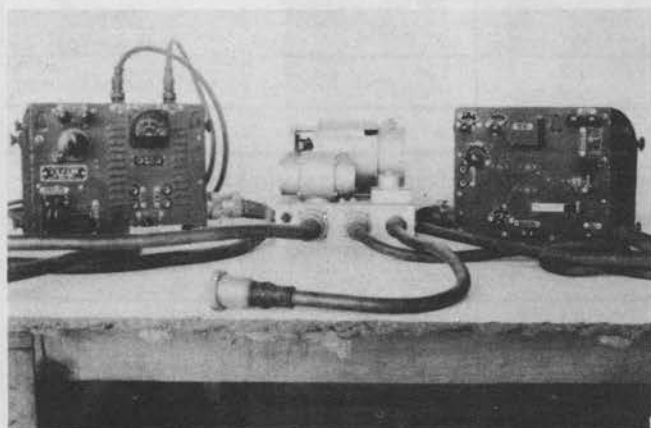
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**RADIO****PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT**

Type 94 Flying Mark 2



Type 96 Mark 2



Type 96 Aero Mark 1

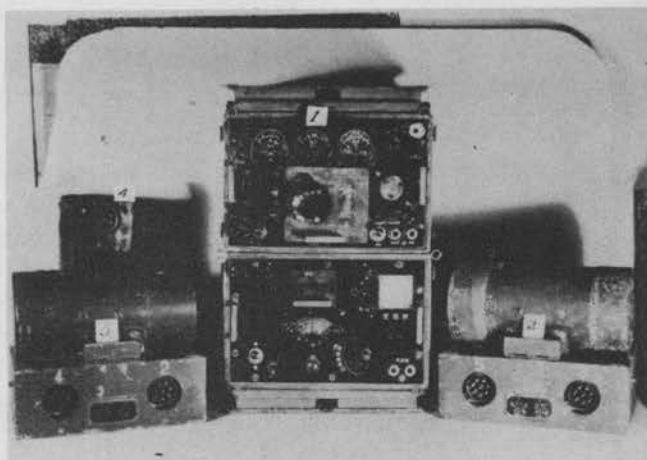
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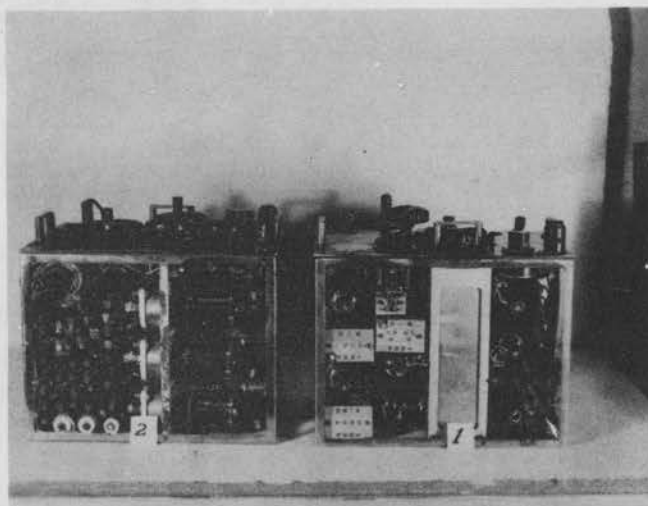
# RADIO

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PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT



Type 99 Flying Mark 1  
(1) Rec. and Trans. (2) Dynamotor (3) Dynamotor (4) Junction Box



Type 99 Mark 1 (1) Receiver (2) Transmitter

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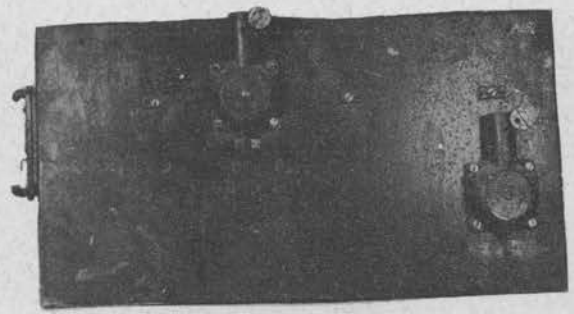
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RADIO

PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

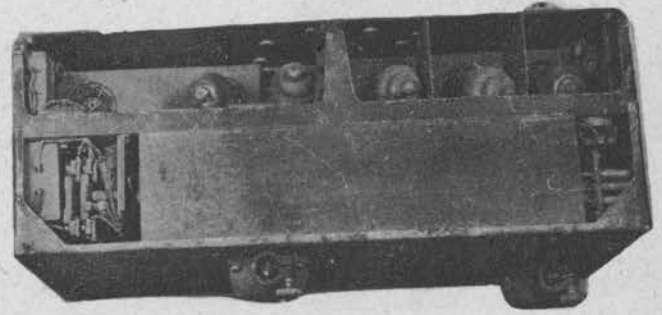
RADIO DIRECTION FINDERS

ARMY



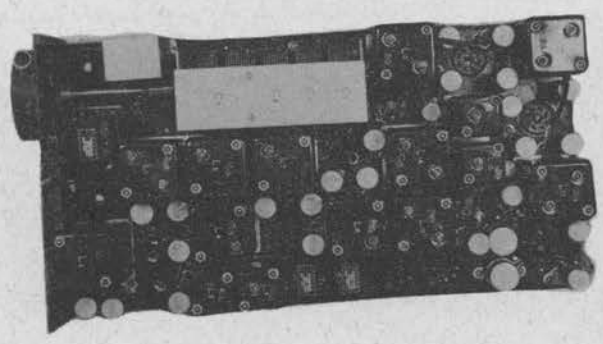
Front

H1 1 Mod. 2



Top

NAVY



Type 1 Ku 3

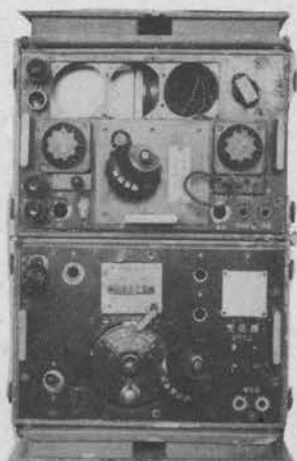
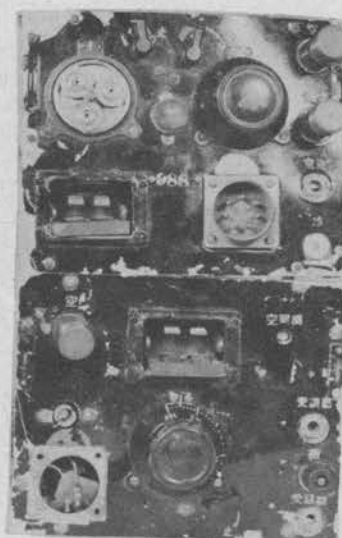
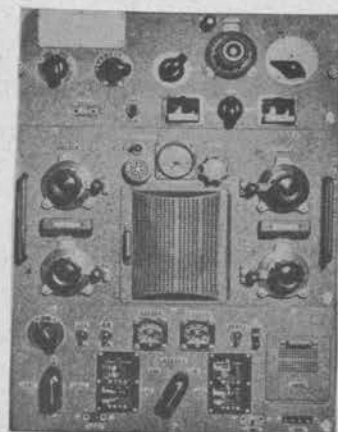
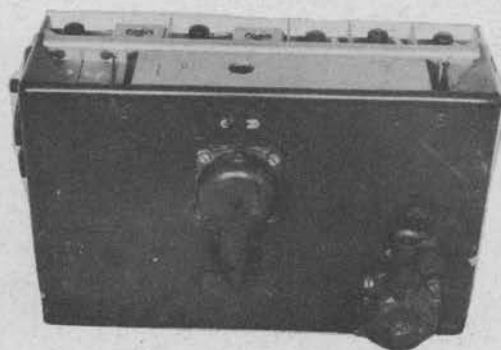
RESTRICTED



## RADIO

## PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

## RADIO

Type 99 H1 1Type 4 H1 3 Mod. 2Type 2 Ku 3H1 2 RDF

RESTRICTED

UNCLASSIFIED

DATE March 1945

# RADIO

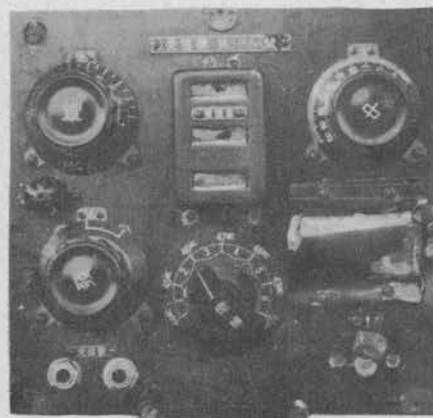
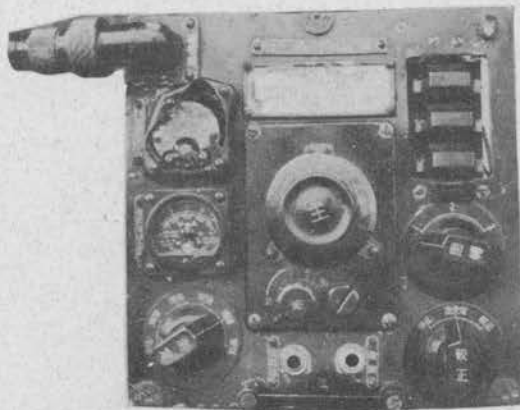
UNCLASSIFIED RADIO

## PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

Type 99 H1 3



Type 99 H1 4



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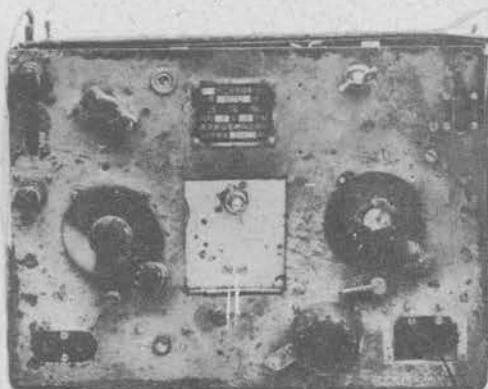
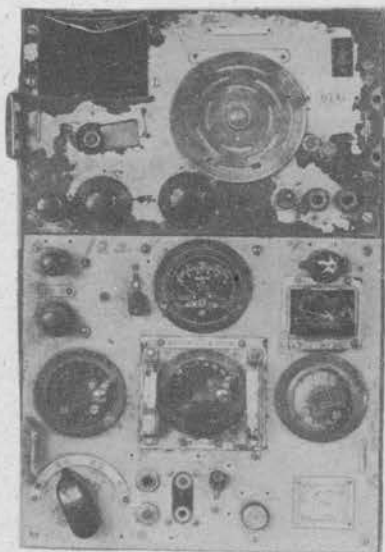
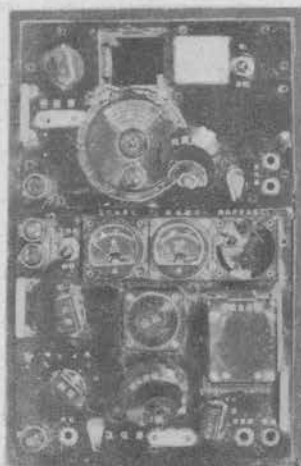
DATE March 1946

RADIO

PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

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RADIO

Type 94 H1 2Type 96 H1 2Type 99 H1 2

RESTRICTED

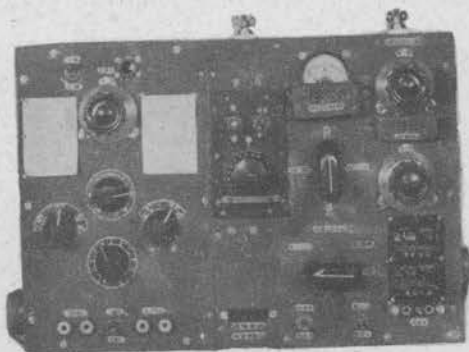
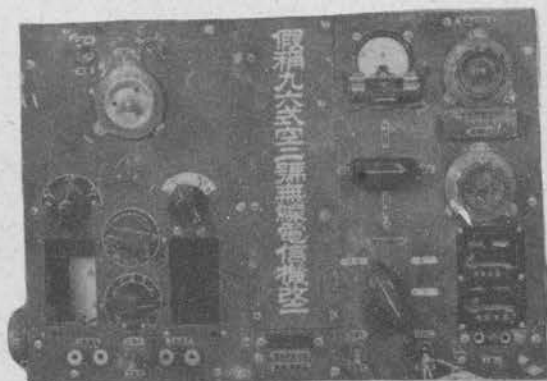
UNCLASSIFIED

DATE March 1945

RADIO

UNCLASSIFIED RADIO

## PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

Type 1 Ku 3Type 96 Ku 2 Mod. 1Type 96 Ku 2 Mod. 2

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DATE March 1948

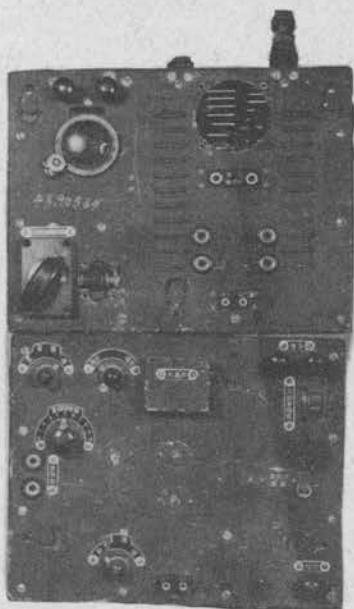
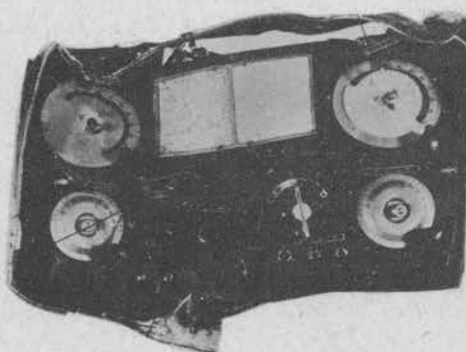
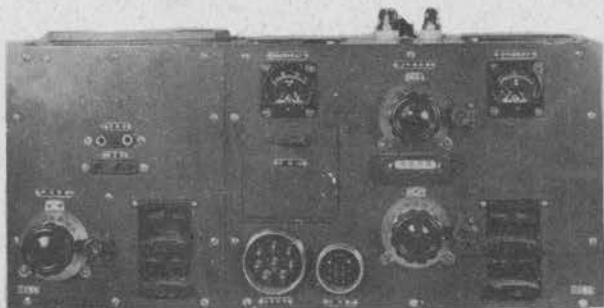
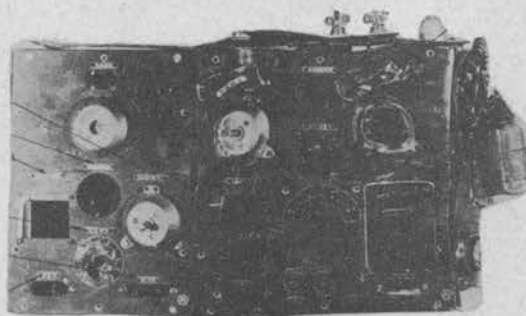


RADIO

UNCLASSIFIED

RADIO

## PHOTOGRAPHS—JAPANESE AIRCRAFT RADIO EQUIPMENT

Type 96 Ku 1Type 96 Ku 3  
(Receiver)Type 96 Ku 4

Type 3 Ku 1

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DATE March 1945

NOTES





1000

3 1695 00525 6508

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CONVERSION TABLE

(ALL FIGURES AVERAGE)

TO CONVERT	INTO	MULTIPLY BY
Atmospheres	Lbs./In. <sup>2</sup>	14.7
C°	F°	$(C° \times 9/5) + 32$
Centimeters	Inches	0.3937
Cubic Centimeters	Cubic Inches	0.0610
Cubic Feet	Gallons (U. S.)	7.51
Cubic Feet	Gallons (Imp.)	6.23
Cubic Inches	Cubic Centimeters	16.3872
Cubic Inches	Liters	0.0164
Cubic Meters	Cubic Feet	35.3144
Cubic Meters	Cubic Yards	1.3079
Cubic Yards	Cubic Meters	0.7646
F°	C°	$(F° - 32) \times 5/9$
Fathoms	Feet	6
Feet	Fathoms	0.1666
Feet	Meters	0.3048
Feet/Minute	Miles/Hour	0.01137
Feet/Second	Miles/Hour	0.6818
Feet/Second	Meters/Minute	18.288
Gallons (Imp.)	Gallons (U. S.)	1.205
Gallons (U. S.)	Gallons (Imp.)	0.8327
Gallons (Imp.)	Cubic Feet	0.1605
Gallons (U. S.)	Cubic Feet	0.1337
Gallons (Imp.)	Liters	4.543
Gallons (U. S.)	Liters	3.7853
Gallons Gasoline (Imp.)	Lbs.	7.25
Gallons Gasoline (U. S.)	Lbs.	6.13
Gallons Oil (Imp.)	Lbs.	9.4
Gallons Oil (U. S.)	Lbs.	7.5
Gallons Water (Imp.)	Lbs.	10.00
Gallons Water (U. S.)	Lbs.	8.3
Grains	Grams	0.0648
Grams	Grams	15.4324
Grams	Ounces (Avoirdupois)	0.0352
HP (Metric)	HP (U. S.)	0.9863
HP (U. S.)	HP (Metric)	1.014
Inches	Centimeters	2.5399
Inches	Feet	0.0833
Inches	Meters	0.0254
Inches	Millimeters	25.4001
Inches	Yards	0.0277
Kg./Cm. <sup>2</sup>	Lbs./In. <sup>2</sup>	14.22
Kg./Meter <sup>2</sup>	Lbs./Ft. <sup>2</sup>	0.2048
Kg./Metric HP	Lbs./Brake HP (Engl.)	2.236
Kilograms (1000 gms.)	Lbs. (Avoirdupois)	2.2046
Kilograms	Ounces (Avoirdupois)	35.2739
Kilometers	Statute Miles	0.6213
Kilometers	Nautical Miles	0.5395
Km./Liter	Miles/Gallon (U. S.)	2.35
Lb. (7000 gms.)	Kilograms	0.4536
Lbs./In. <sup>2</sup>	Kg./Cm. <sup>2</sup>	0.0703
Lbs./Ft. <sup>2</sup>	Kg./Meters <sup>2</sup>	25.83
Lbs./In. <sup>2</sup>	Atmospheres	0.068
Lbs./B. H. P. (Engl.)	Kg./HP (Metric)	0.447
Liters	Cubic Inches	61.025
Liters	Gallons (Imp.)	0.220
Liters	Gallons (U. S.)	0.264
Liters	Pints (Imp.)	1.76
Liters	Pints (U. S.)	2.1134
Long Tons	Lbs.	2240
Meters	Feet	3.2808
Meters	Inches	39.37
Meters	Yards	1.0936
Meters/Minute	Feet/Second	0.0547
Meters/Second	Miles/Hour	2.237
Miles	Kilometers	1.6093
Miles/Gallon (U. S.)	Km./Liter	0.428
Miles/Hour	Feet/Minute	88
Miles/Hour	Feet/Second	1.467
Miles/Hour	Knots	0.8684
Miles/Hour	Meters/Second	0.447
Millimeters	Inches	0.0393
Nautical Miles	Kilometers	1.8516
Nautical Miles	Statute Miles	1.1516
Ounces (Avoirdupois)	Grams	28.349
Ounces (Avoirdupois)	Kilograms	0.0283
Pints (Imp.)	Liters	0.568
Pints (U. S.)	Liters	0.4732
Ship Tons	Cubic Feet	40
Short Tons	Lbs.	2000
Square Centimeters	Square Inches	0.155
Square Feet	Square Meters	0.0929
Square Inches	Square Centimeters	6.4516
Square Km.	Square Miles	0.3861
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.1960
Square Miles	Square Kilometers	2.590
Square Yards	Square Meters	0.8361
Statute Miles	Nautical Miles	0.8684
Yards	Meters	0.914

1 English Atmosphere — 14.7 Lbs./In.<sup>2</sup> — 29.92" Hg — 1.033 Kg./Cm.<sup>2</sup>  
 1 Metric Atmosphere — 14.2 Lbs./In.<sup>2</sup> — 28.87" Hg — 1.000 Kg./Cm.<sup>2</sup>  
 Sea Level Pressure — 14.7 Lbs./In.<sup>2</sup>

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# EQUIVALENT BOOST PRESSURE

U. S.	BRITISH	JAP	GERMAN	U. S.	BRITISH	JAP	GERMAN
29	-.5	-30	1.00	41	+5.5	+280	
		-20				+290	
		-10				+300	
30	0	0		42	+6.0	+310	1.45
		+10	1.05			+320	
		+20				+330	
31	+ .5	+30		43	+6.5	+340	1.50
		+40				+350	
		+50	1.10	44	+7.0	+360	
32	+1.0	+60				+370	
		+70				+380	1.55
33	+1.5	+80	1.15	45	+7.5	+390	
		+90				+400	
		+100		46	+8.0	+410	1.60
34	+2.0	+110				+420	
		+120	1.20	47	+8.5	+430	
35	+2.5	+130				+440	
		+140				+450	1.65
		+150		48	+9.0	+460	
36	+3.0	+160	1.25			+470	
		+170				+480	
37	+3.5	+180		49	+9.5	+490	1.70
		+190				+500	
		+200	1.30	50	+10.0	+510	
38	+4.0	+210				+520	
		+220				+530	1.75
39	+4.5	+230	1.35	51	+10.5	+540	
		+240				+550	
		+250		52	+11.0	+560	1.80
40	+5.0	+260				+570	
		+270	1.40			+580	
41		+280		53			

PREVENT SOUVENIRING

#061278

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